SOUTHERN STATES ENERGY BOARD

*Transcending Boundaries*

# Southern States Regional Energy Profiles

2016

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# 2016 Regional Energy Profiles

July 2016

SOUTHERN STATES ENERGY BOARD

*Transcending Boundaries*

June 28, 2016

Dear Board Members, Associate Members and Colleagues:

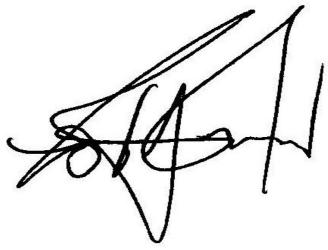
The Southern States Energy Board is pleased to present this third edition of *Southern States Energy Profiles*, a report that provides an overview of the changing patterns of energy consumption across the South. This is a cooperative venture between the Southern States Energy Board and the Kentucky Department for Energy Development and Independence in the Energy and Environment Cabinet. Both organizations are indebted to the United States Department of Energy's Office of Fossil Energy, which provided grant funding to perform the assessments contained in the report.

As with previous editions, this report serves as a foundation for the discussion of energy programs, policies, and technologies that can enhance economic development and the quality of life in the region. These state energy profiles show the importance of energy to the South. In 2015, the 16 member states and 2 territories in the SSEB region consumed more than 46 percent of the electricity used nationwide. Energy consumption per capita and per unit of gross domestic product (GDP) continues to be substantially higher in the South than in the rest of the nation. Total energy consumption in member states has risen by 181 percent from 1960, to more than 44 Quadrillion Btu in 2014.

Energy-intensive industrial and manufacturing processes found in the South continue to consume more energy than other economic sectors. Residential and commercial energy consumption rates also are growing faster than industrial demand due in part to an increase in population and as business is relocated to the SSEB region.

For the first time, electricity in the region is primarily supplied by natural-gas fired power plants. In 2015, natural gas was used to generate 773 TWh, 40 percent of electricity generation, compared with 34 percent two years ago. While the South remains the leader in energy consumption, electricity prices in 2015 were lower than the national average. Even though residential prices were considerably lower in the region, consumption per household remains higher than the national average partially due to those lower prices, weather requiring a heavy air-conditioning load, and housing stock.

We would like to recognize the public sources used in aggregating data for this report. The Energy Information Administration of the U.S. Department of Energy; U.S. Environmental Protection Agency; the Bureau of Labor Statistics; the Bureau of Economic Analysis; and the Census Bureau have all provided data used in the report. The document compares energy consumption, energy sources, electricity consumption, electricity generation and emissions, electricity prices, and energy exports between all SSEB member states, the SSEB region, and the United States.



Kenneth J. Nemeth
Secretary and Executive Director

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# Southern States Energy Board

**About Southern States Energy Board**

The Southern States Energy Board (SSEB) is a non-profit interstate compact organization created in 1960 and established under Public Laws 87-563 and 92-440. The Board's mission is to enhance economic development and the quality of life in the South through innovations in energy and environmental policies, programs and technologies. Sixteen southern states and two territories comprise the membership of SSEB: Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, Missouri, North Carolina, Oklahoma, Puerto Rico, South Carolina, Tennessee, Texas, U.S. Virgin Islands, Virginia and West Virginia. Each jurisdiction is represented by the governor and a legislator from the House and Senate. A governor serves as the chair and legislators serve as vice-chair and treasurer. Ex-officio non-voting Board members include a federal representative appointed by the president of the United States and SSEB's executive director, who serves as secretary.

SSEB was created by state law and consented to by Congress with a broad mandate to contribute to the economic and community well-being of the southern region. The Board exercises this mandate through the creation of programs in the fields of energy and environmental policy research, development and implementation, science and technology exploration and related areas of concern. SSEB serves its members directly by providing timely assistance designed to develop effective energy and environmental policies and programs and represents its members before governmental agencies at all levels.

**Long-term Goals**

- Perform essential services that provide direct scientific and technical assistance to state governments;
- Develop, promote and recommend policies and programs on energy, environment and economic development that encourage sustainable development;
- Provide technical assistance to executive and legislative policy-makers and the private sector in order to achieve synthesis of energy, environment and economic issues that ensure energy security and supply;
- Facilitate the implementation of energy and environmental policies between federal, state and local governments and the private sector;
- Sustain business development throughout the region by eliminating barriers to the use of efficient energy and environmental technologies; and
- Support improved energy efficient technologies that reduce environmental impacts and contribute to a clean global environment while protecting indigenous natural resources for future generations.

# Executive Summary

This is the third edition of *Southern States Energy Profiles,* a report that provides an overview of electricity generation and energy consumption within the SSEB region. The *Profiles* also serve as a foundation for discussing energy and environmental policies, programs, and technologies that can help SSEB states assess trends in the energy landscape and help them to identify economic development opportunities.

This report is a collaboration between the SSEB and the Kentucky Department for Energy Development and Independence (DEDI), Energy and Environment Cabinet. All of the data summarized in this report were aggregated from public sources, specifically the following agencies of the U.S. government: Energy Information Administration (EIA); Environmental Protection Agency (EPA); Bureau of Labor Statistics (BLS); Bureau of Economic Analysis (BEA); and the Census Bureau. Data compares the SSEB region and individual states with national averages for energy and electricity consumption, electricity generation and emissions from that generation, electricity prices, and energy exports. Note that comparable data for Puerto Rico and the U.S. Virgin Islands was limited at the time of publication. Data available is represented in energy consumption by sector.

Changing Electricity Generation Portfolio

The electricity generation portfolios of both the SSEB region and the United States are rapidly changing, influenced by market conditions, environmental regulations, and state and federal policies related to energy production. The most notable change is the regional shift from coal to natural gas as the dominant source for electricity generation. Since the second edition of these *Profiles* two years ago, electricity generated by natural gas has increased from 34 percent to 40 percent. During this same time period, coal-fired generation has decreased from 40 percent to 33 percent. Renewable electricity generation increased by 17 percent in the SSEB region in 2015. Wind power remains the fastest growing and is now the dominant source, at 43 percent, of renewable electricity generation in the region. Hydroelectric generation, which varies from year to year due to rainfall and temperature, represents 33 percent of the renewable electricity in the region. Solar generation exhibited the largest proportional gain, increasing 67 percent in 2015.

Emissions Reductions

Pollution mitigation measures at regional power plants include the use of lower-sulfur fuels and the installation of clean coal technologies. In the SSEB region, sulfur dioxide ($SO_2$) emissions from electricity generation have been reduced 81 percent since 1995. Despite a 32 percent increase in electricity consumption since 1995, carbon dioxide ($CO_2$) emissions in the SSEB region have increased by only 1.1 percent. Regionally, $CO_2$ emissions from electricity generation peaked at 1.3 billion tons in 2007 and were reduced to 1.049 billion tons in 2015, a 17 percent decrease in the past ten years.

Stable Electricity Prices

Electricity prices in the SSEB region in 2015 were 11 percent lower than the national average and have remained approximately stable over the past decade (in real terms). Industrial and residential prices averaged 6.0 and 11.3 cents/ kWh while commercial rates were 8.9 cents in 2015. Monthly electricity bills paid by residential consumers averaged $129.13 in 2015, which was 13.4 percent higher than the national average.

Energy Consumption

The 16 member states and 2 territories in the SSEB region consumed 46 percent of the total energy used in the United States in 2014 (the last year for available data on total energy consumption). Petroleum, used primarily for transportation fuels such as diesel and motor gasoline, continues to be the region's primary energy source, accounting for 39 percent of all energy consumed. Natural gas is the second largest energy source, supplying 27 percent of energy demand and is used primarily for industrial processes, electricity generation and home heating. Coal is the region's third largest energy source, supplying 19 percent of energy requirements. Nuclear power supplied 8 percent of the regional energy requirements. Finally, renewable energy sources, primarily electricity generated from wind and hydroelectric power, and wood waste, supplied 6 percent of the energy consumed in the region in 2014. Solar power exhibited the largest annual increase, 67 percent, in renewable energy resources in the region. With low natural gas prices and increased environmental regulations, along with dramatic reduction in the cost of renewable resources, a number of changes are occurring in the traditional energy mix.

# SSEB Region States

**This document is intended to provide an overview of energy in the following states, both individually and as a region.**

**ALABAMA**

**ARKANSAS**

**FLORIDA**

**GEORGIA**

**KENTUCKY**

**LOUISIANA**

**MARYLAND**

**MISSISSIPPI**

**MISSOURI**

**NORTH CAROLINA**

**OKLAHOMA**

**PUERTO RICO**

**SOUTH CAROLINA**

**TENNESSEE**

**TEXAS**

**U.S. VIRGIN ISLANDS**

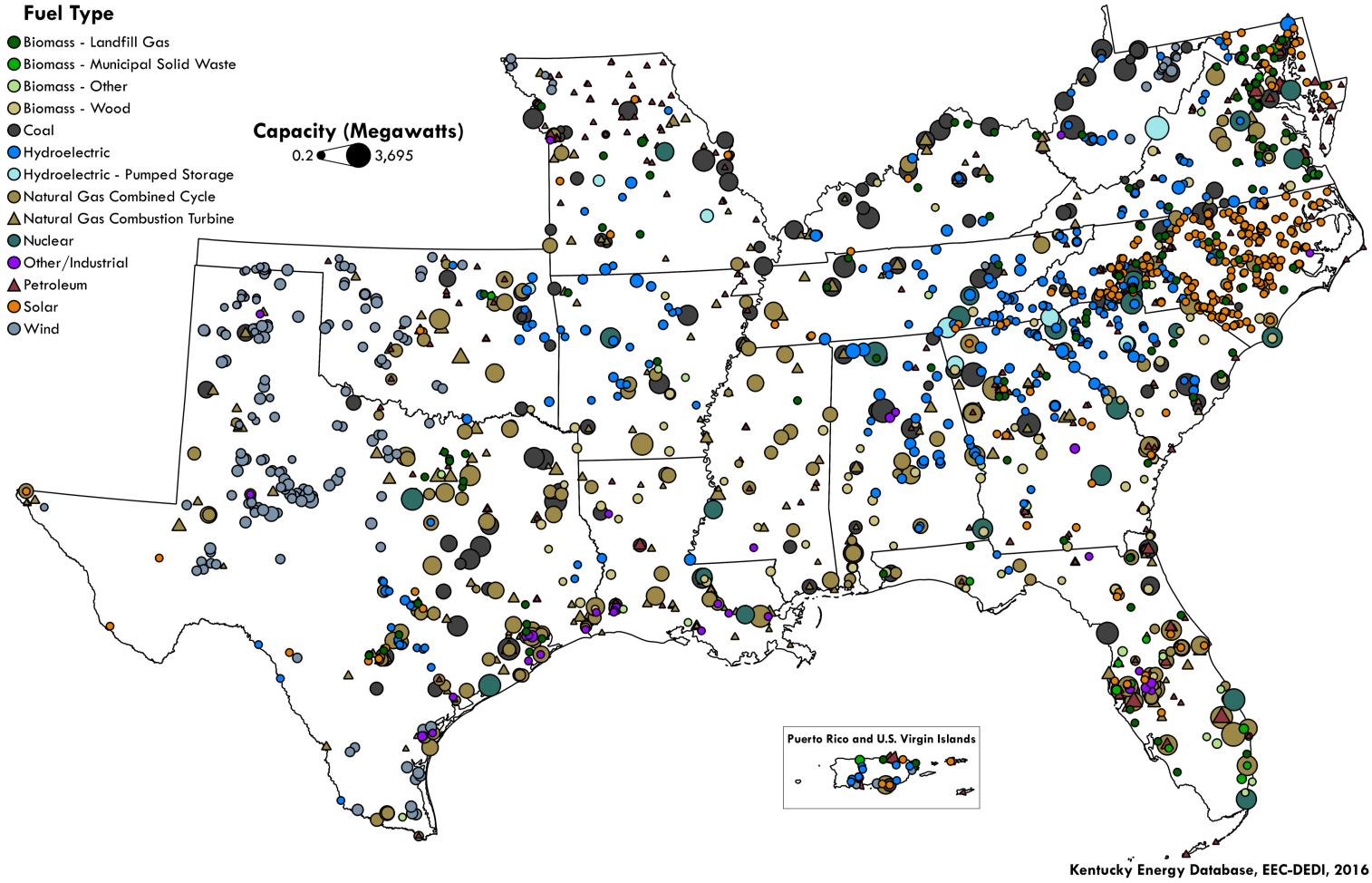
**VIRGINIA**

**WEST VIRGINIA**

Puerto Rico and the U.S. Virgin Islands are represented in this document only partially due to the limited availability of comparable data.

# Electricity Generation Capacity

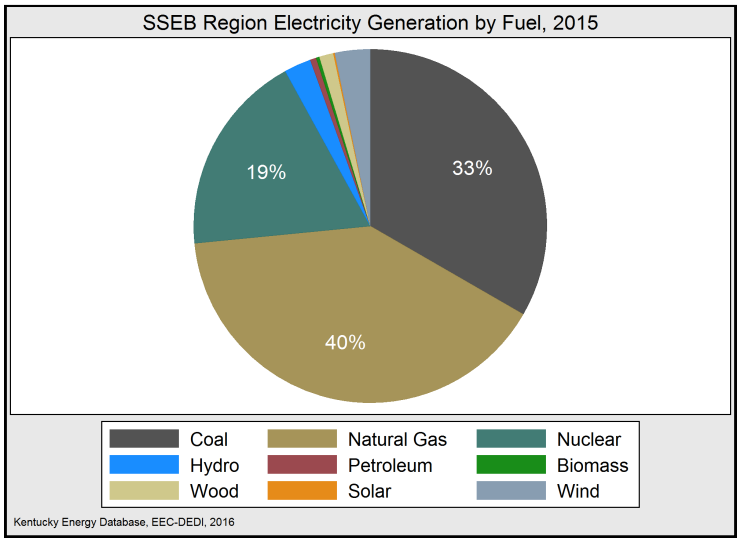
## Power Plants in the SSEB Region, 2015

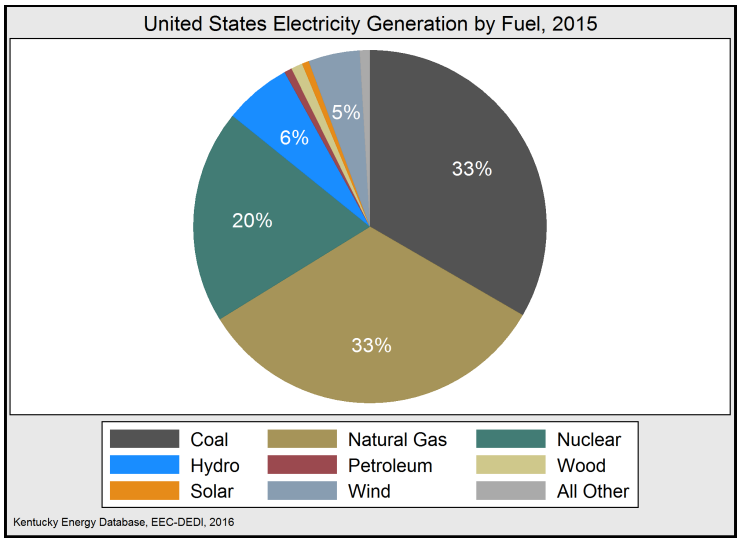



| State | Coal | Biomass | Hydro | Pumped Storage | Natural Gas | Nuclear | Other | Petroleum | Solar | Wind |
|---|---|---|---|---|---|---|---|---|---|---|
| Alabama | 10,919 | 649 | 3,271 | | 11,250 | 5,066 | 100 | 27 | | |
| Arkansas | 5,125 | 308 | 1,352 | | 6,134 | 1,820 | | 12 | | |
| Florida | 9,702 | 1,228 | 55 | | 37,133 | 5,508 | 349 | 5,226 | 81 | |
| Georgia | 9,469 | 913 | 1,975 | 1,935 | 16,544 | 4,061 | 84 | 1,014 | 89 | |
| Kentucky | 13,825 | 70 | 837 | | 5,441 | | | 12 | 7 | |
| Louisiana | 2,385 | 539 | 192 | | 19,460 | 2,133 | 301 | 1,557 | | |
| Maryland | 5,125 | 148 | 590 | | 1,989 | 1,708 | | 2,568 | 76 | 190 |
| Mississippi | 3,638 | 275 | | | 10,591 | 1,409 | 1 | 25 | | |
| Missouri | 12,955 | 14 | 541 | 684 | 4,975 | 1,193 | 1 | 991 | 12 | 459 |
| North Carolina | 11,128 | 622 | 2,063 | | 10,443 | 5,094 | 54 | 424 | 1,001 | |
| Oklahoma | 6,167 | 76 | 863 | 260 | 13,028 | | | 42 | | 4,428 |
| Puerto Rico | 454 | 77 | 54 | | 1,492 | | | 2,679 | 66 | 163 |
| South Carolina | 5,628 | 427 | 1,424 | 2,716 | 5,836 | 6,556 | | 235 | 3 | |
| Tennessee | 9,917 | 194 | 2,619 | 1,616 | 3,116 | 3,401 | | 63 | 45 | 29 |
| Texas | 25,280 | 495 | 671 | | 68,235 | 4,960 | 531 | 32 | 216 | 16,887 |
| Virgin Islands | | | | | | | | 130 | 1 | |
| Virginia | 4,653 | 892 | 1,103 | 3,003 | 10,392 | 3,569 | | 1,777 | | |
| West Virginia | 13,092 | 2 | 301 | | 1,071 | | 2 | | | 615 |
| **SSEB Total** | **149,008** | **6,852** | **17,857** | **10,214** | **225,638** | **46,478** | **1,423** | **14,005** | **1,523** | **22,608** |

*Megawatts (MW) of Summer Generating Capacity

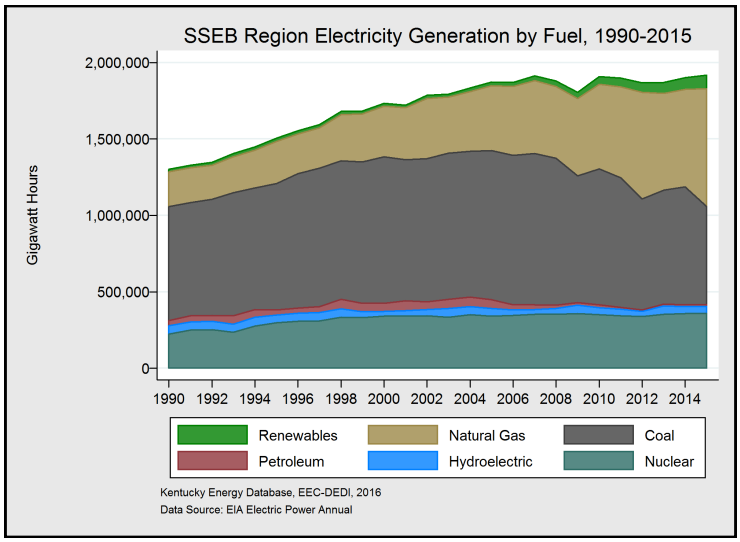
# SSEB Region Electricity Generation

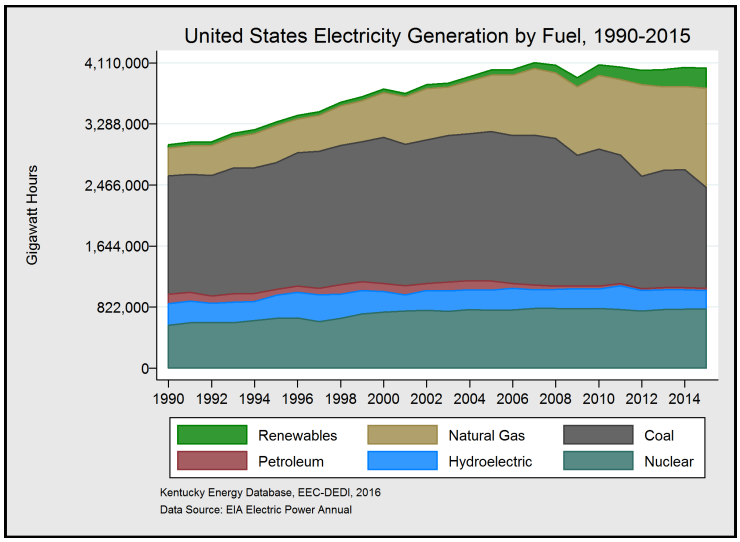



| Source Type | Gigawatt-hours | 2015 Change |
|---|---|---|
| Total | 1,934,091 | +0.9% |
| Natural Gas | 772,612 | +21.4% |
| Coal | 642,023 | -16.9% |
| Nuclear | 357,477 | -0.9% |
| Hydroelectric | 47,787 | +7.5% |
| Wind | 61,867 | +14.2% |

| Source Type | Gigawatt Hours | 2015 Change |
|---|---|---|
| Total | 4,087,382 | -0.2% |
| Coal | 1,356,057 | -14.3% |
| Natural Gas | 1,335,068 | +18.5% |
| Nuclear | 797,178 | +0.0% |
| Hydro | 251,168 | -3.16% |
| Wind | 190,927 | +5.10% |

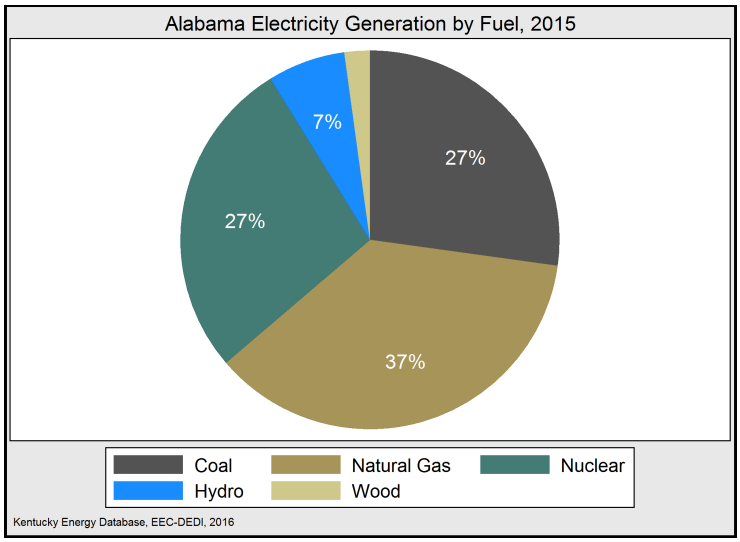


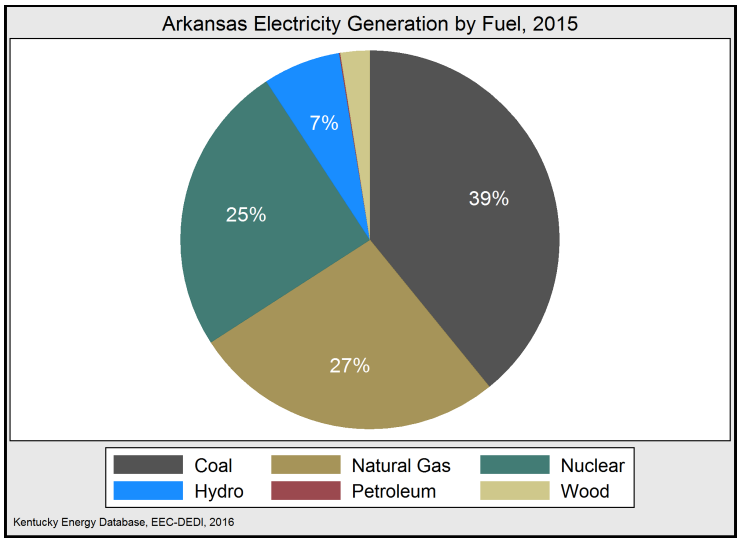



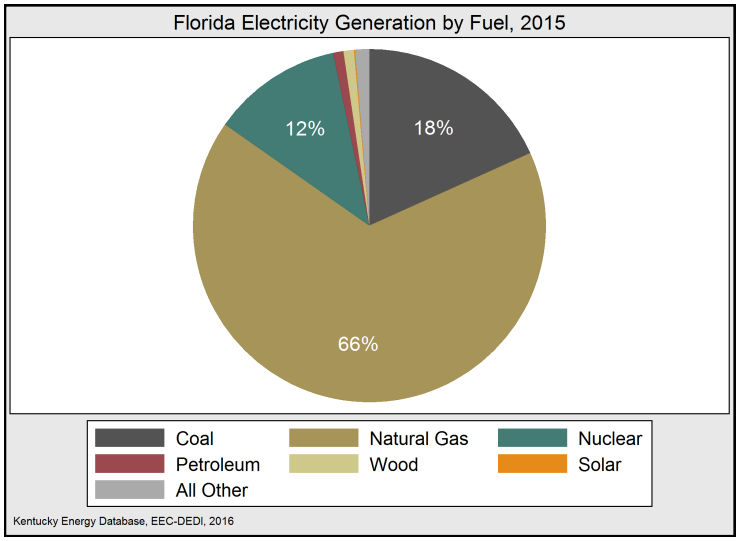

The electricity generation portfolios of both the SSEB region and the United States as a whole are rapidly changing. Coal-fired electricity generation in the SSEB region has declined by 35 percent since peaking in 2007; notably, natural gas has outpaced coal electricity generation within the SSEB region at 40 percent of total generation, as coal's contribution continues to decline. During the same period, natural gas-fired generation has increased by 62 percent and renewable generation has increased by 106 percent.

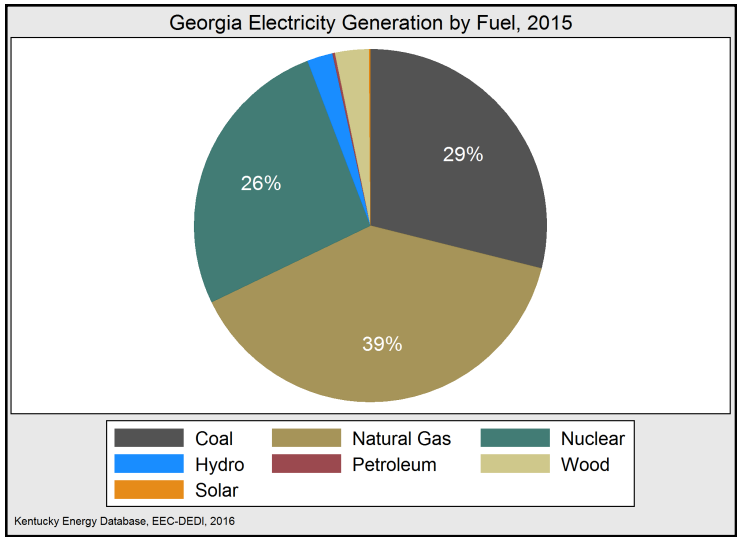
Total electricity generation in the United States slightly decreased by less than a two-tenth of a percent from the prior year to 4,087 TWh in 2015. Coal-fired generation has fallen more than 14 percent in the past year — but still represents 33 percent of 2015 total generation. In contrast, natural gas generation has grown by 19 percent since 2014 to over 1,335 TWh in 2015. Nuclear and hydroelectric generation have remained fairly constant nationally as well as in the SSEB region.

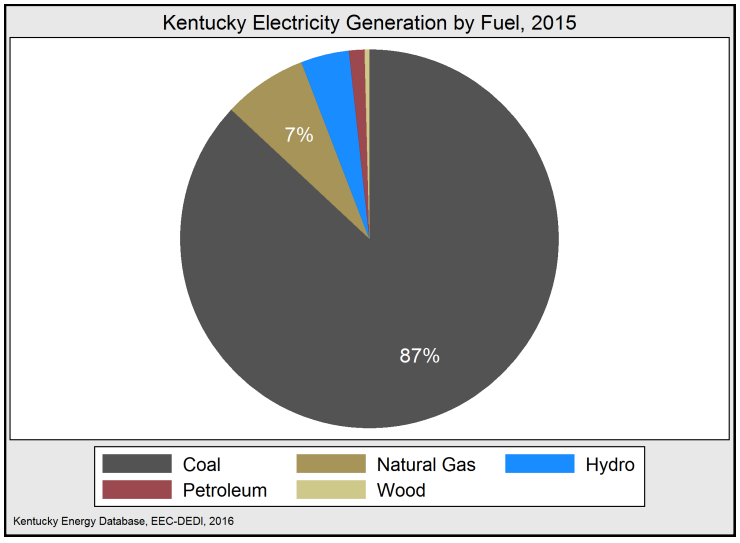
# Electricity Generation

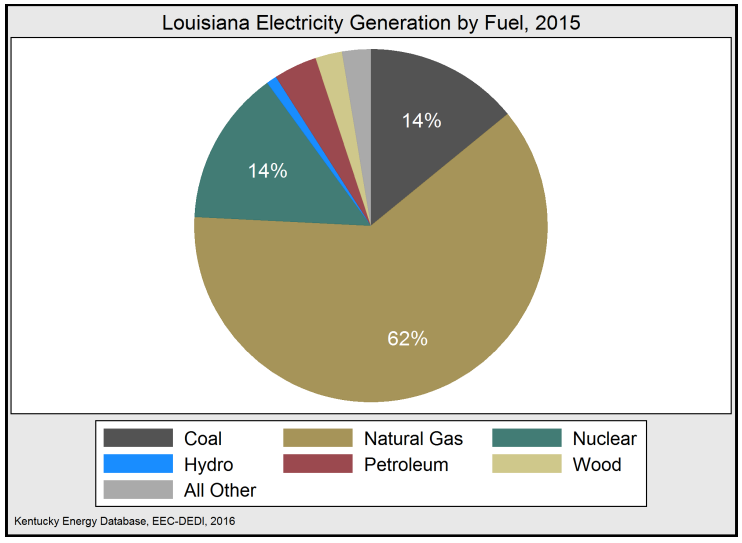


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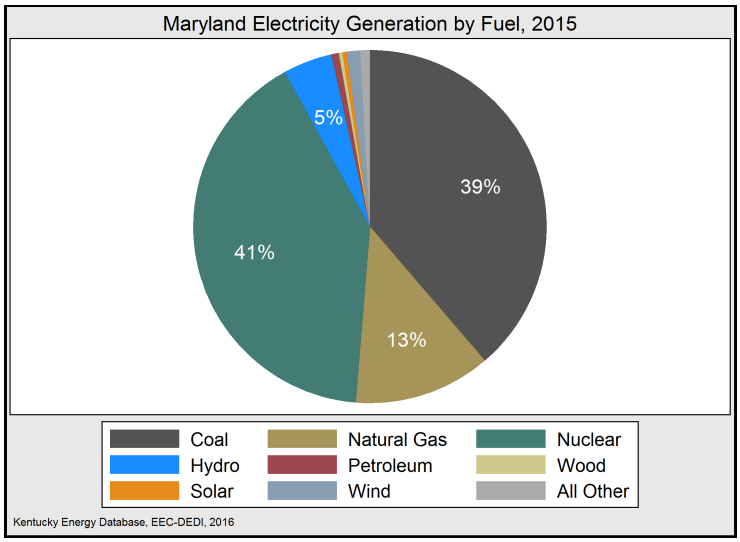


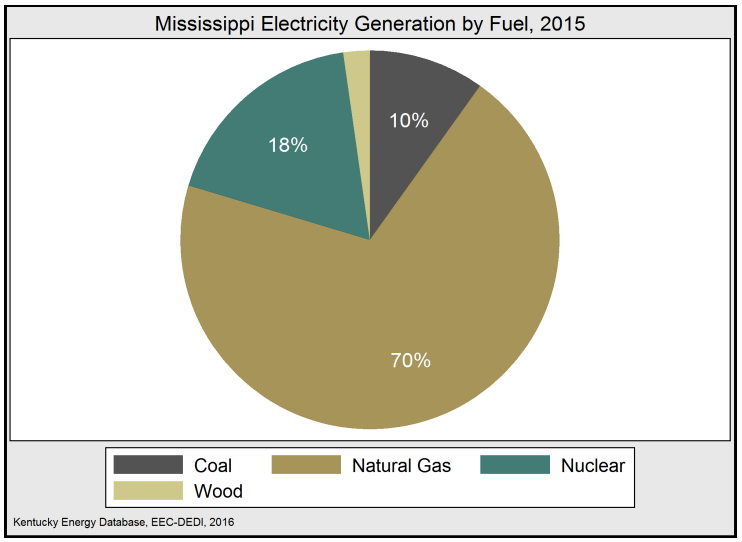


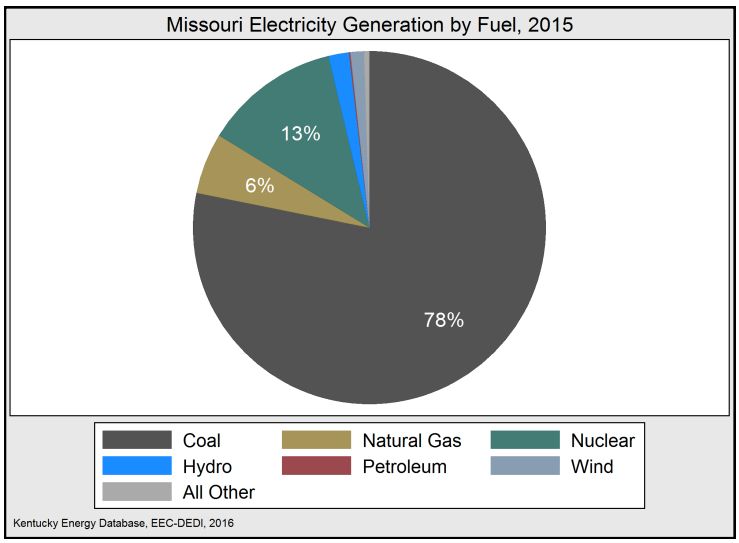


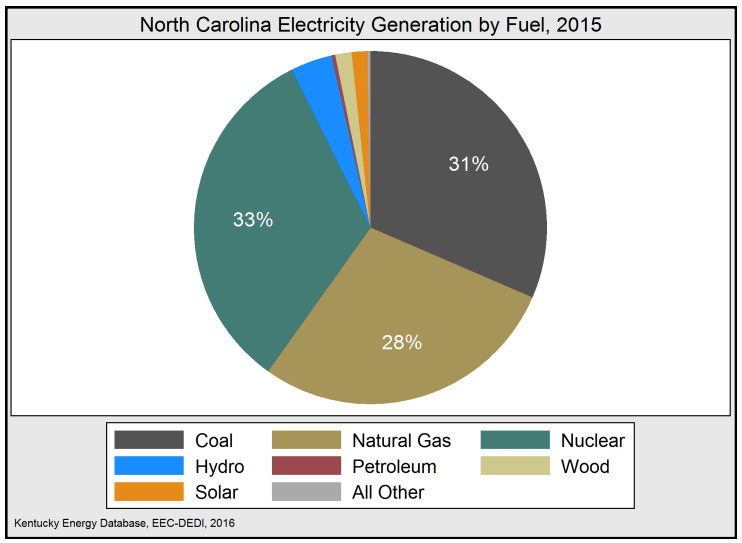


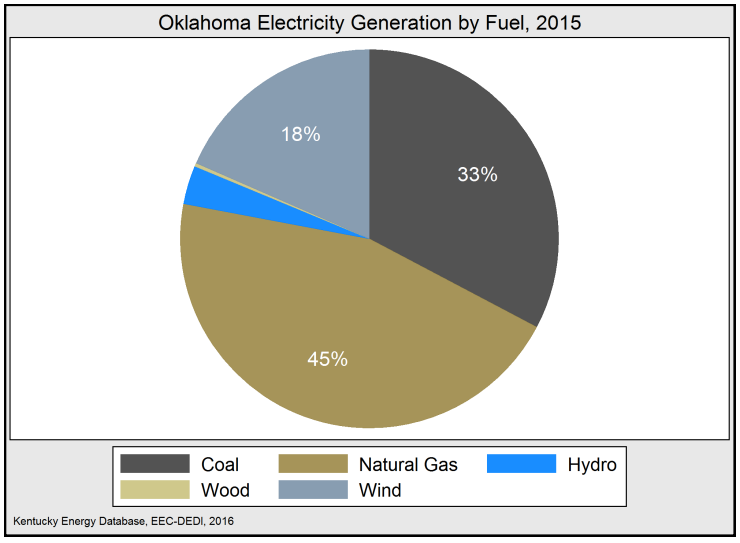


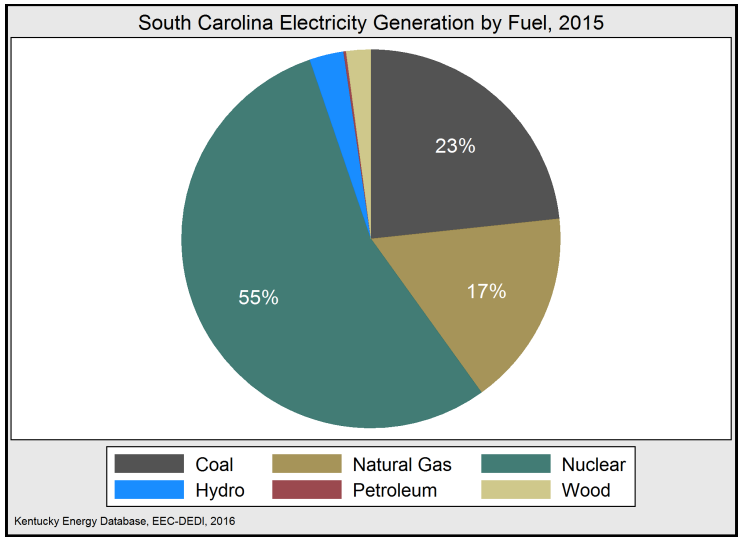

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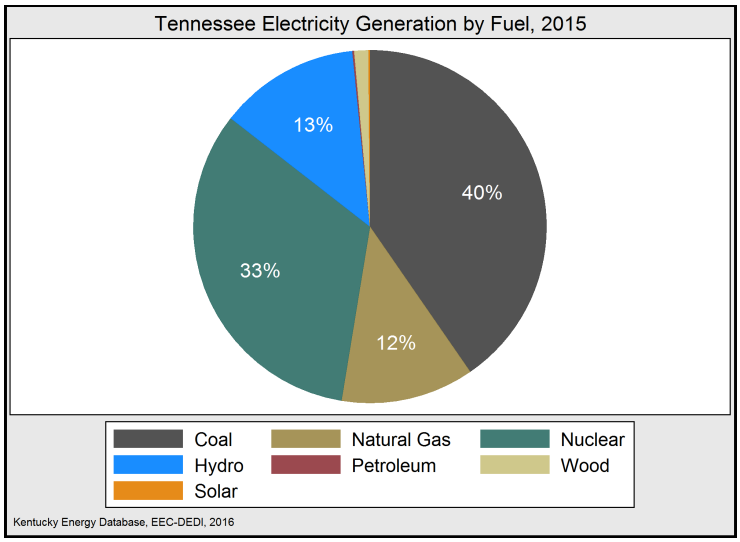


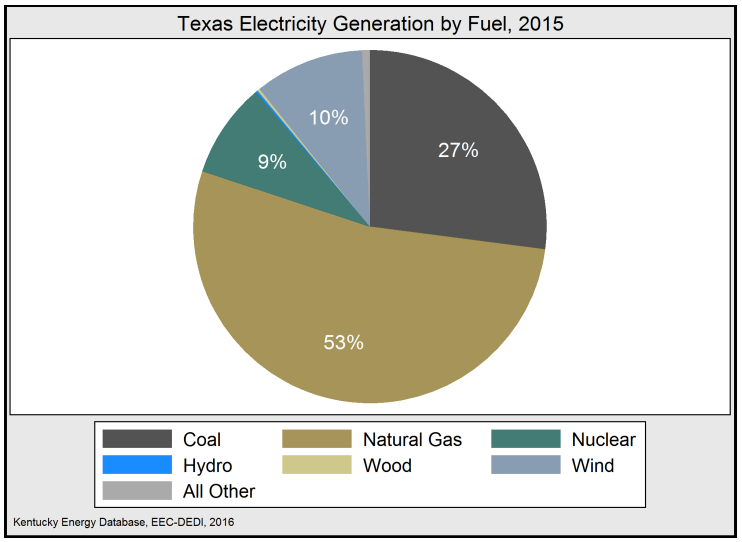


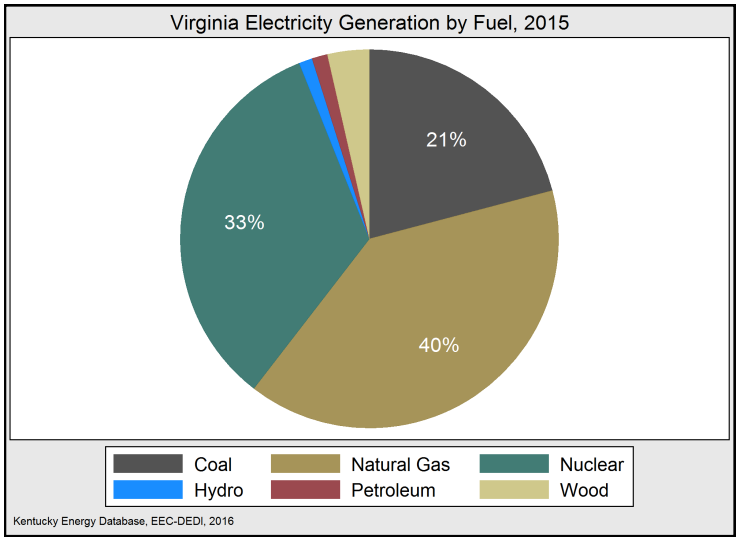


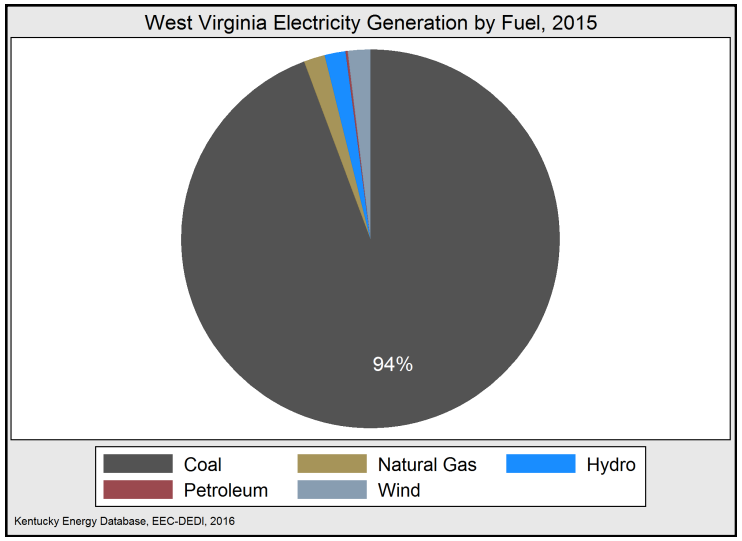

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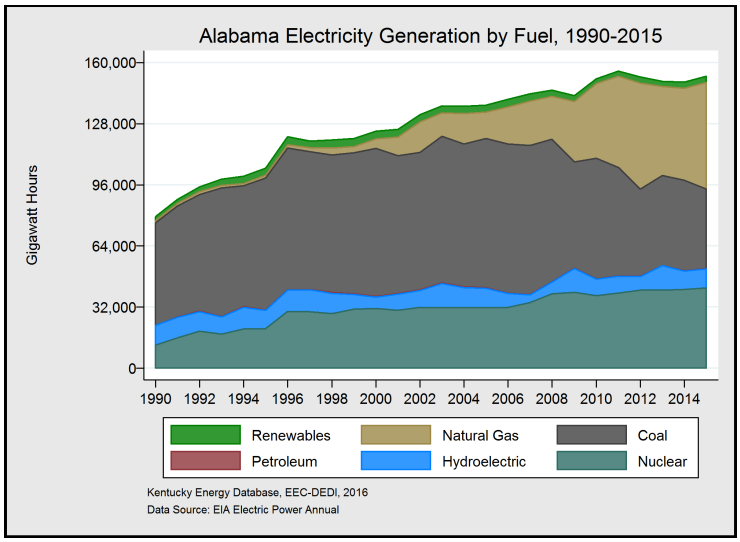


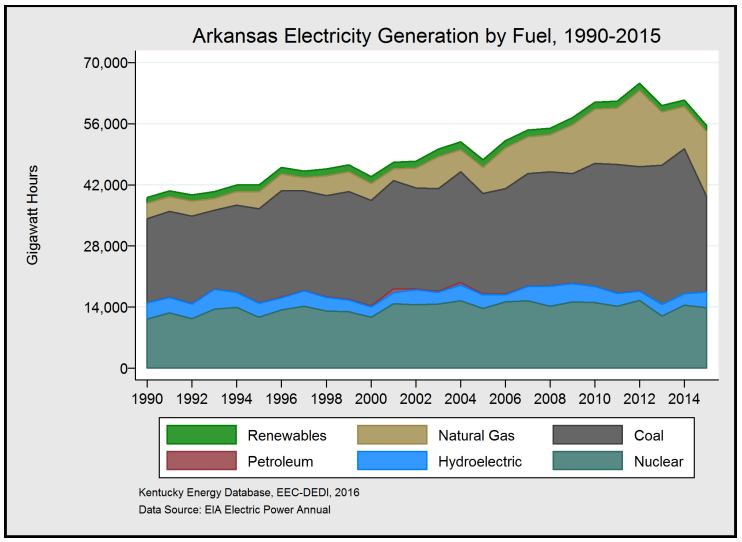


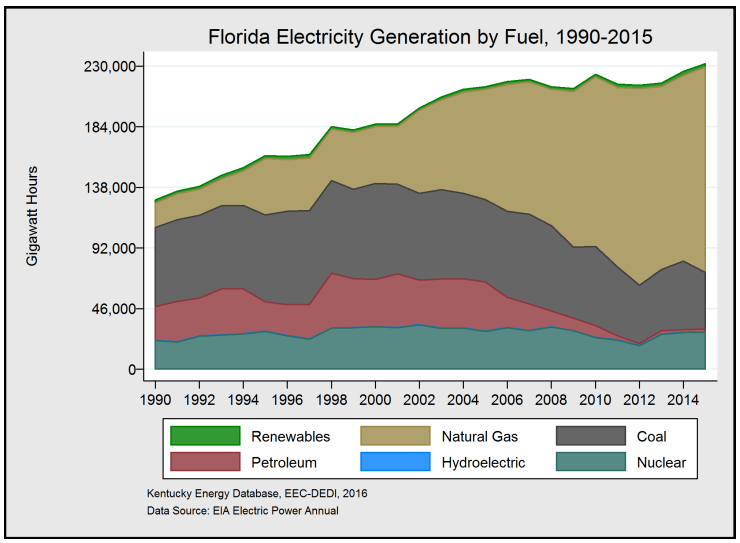


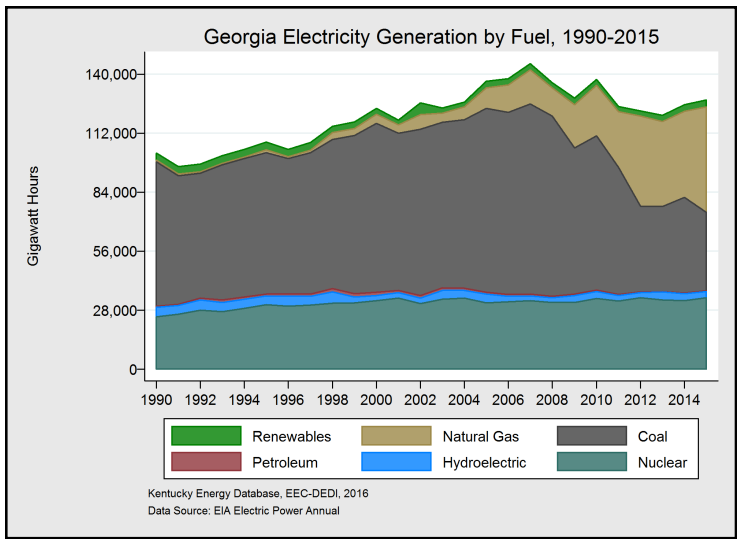


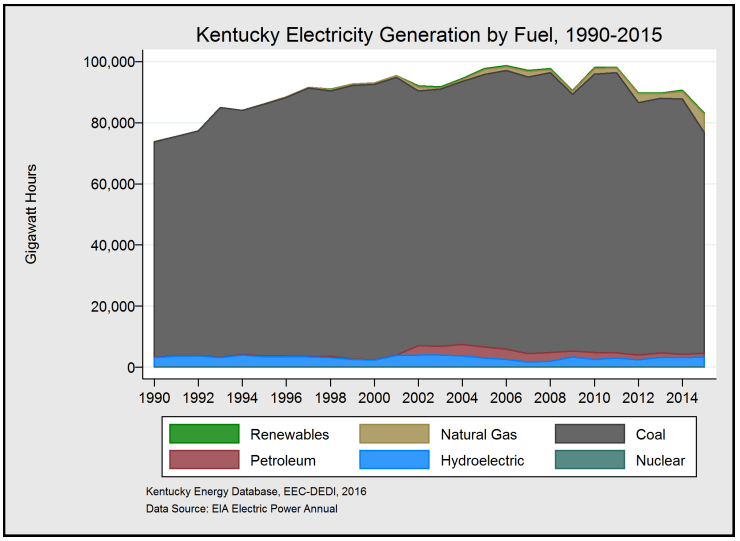


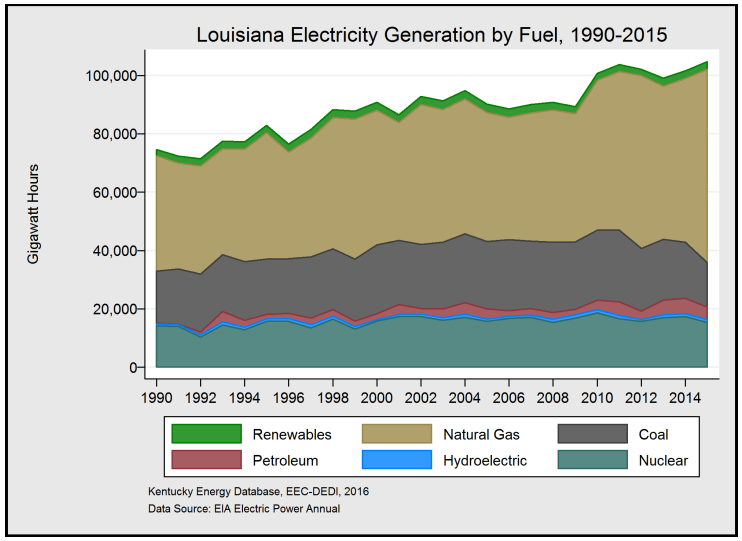

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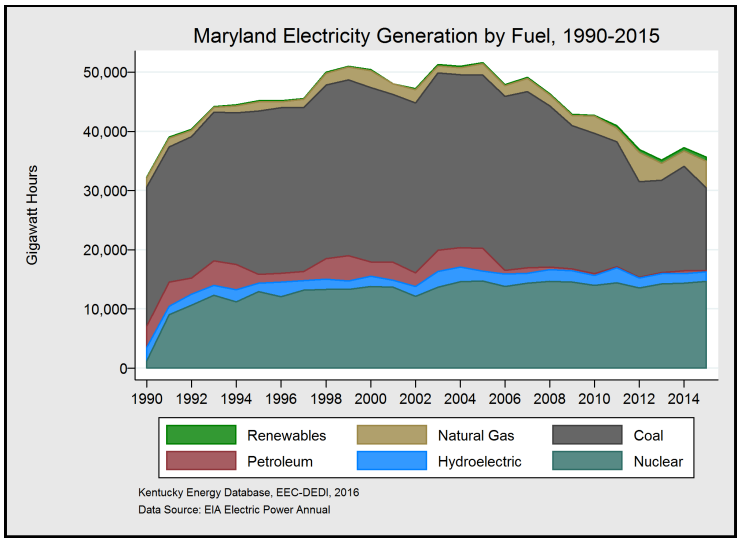


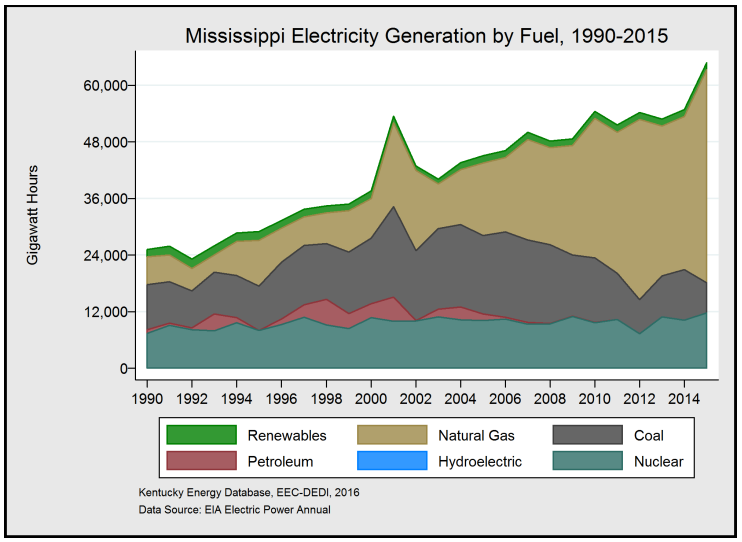


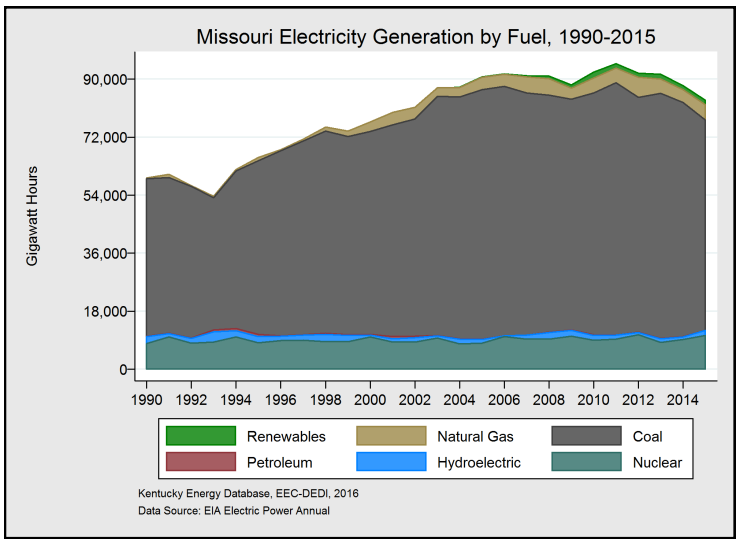


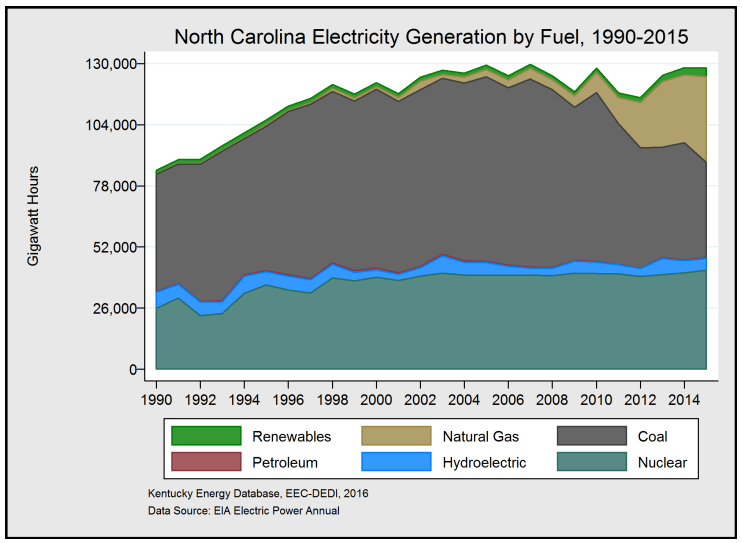


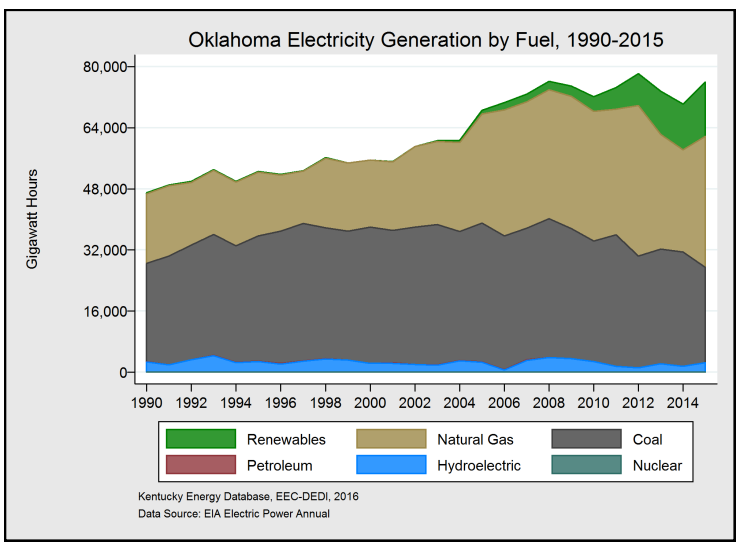


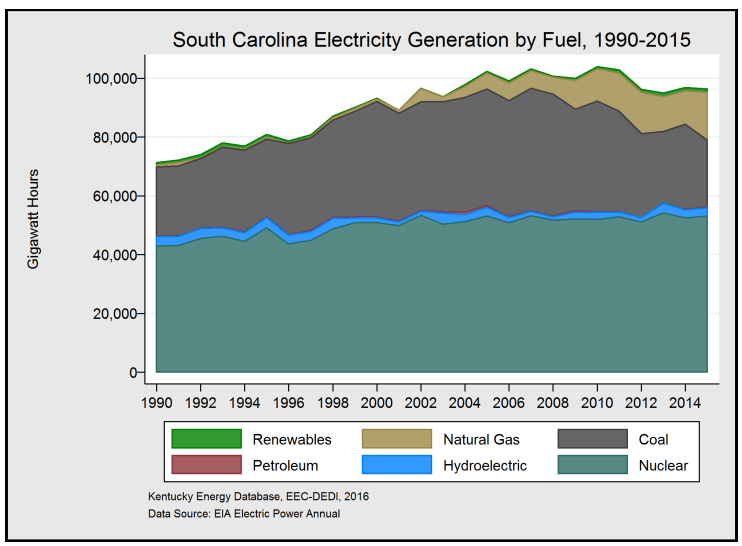

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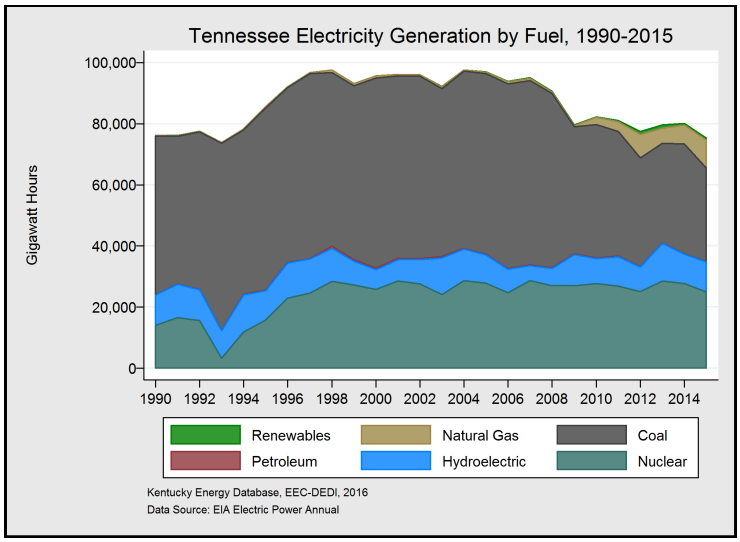
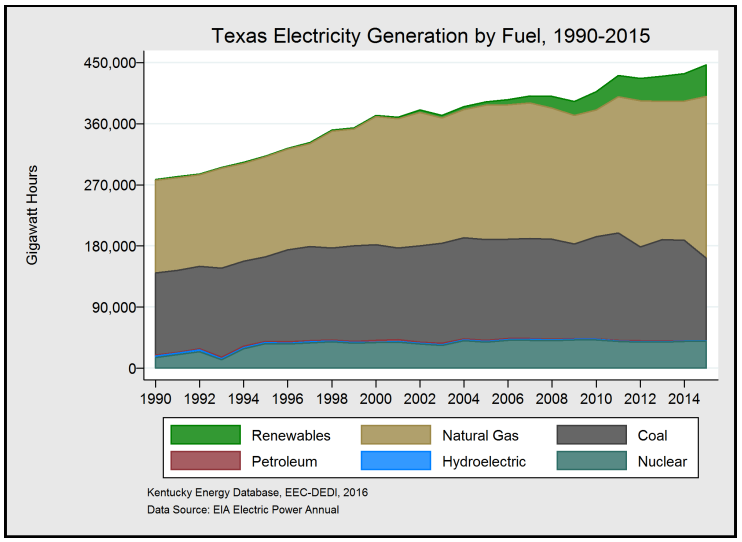
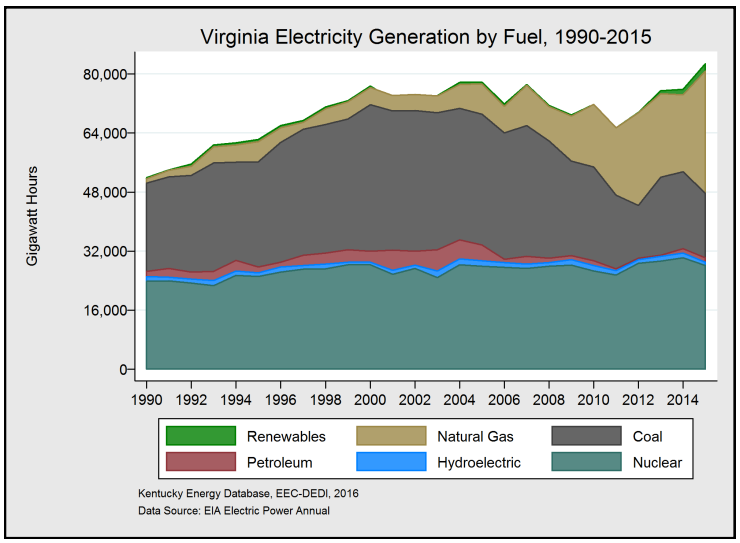
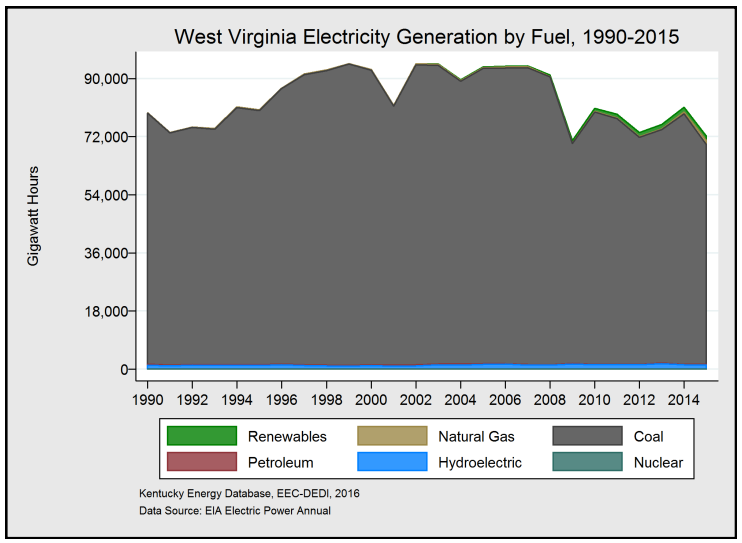
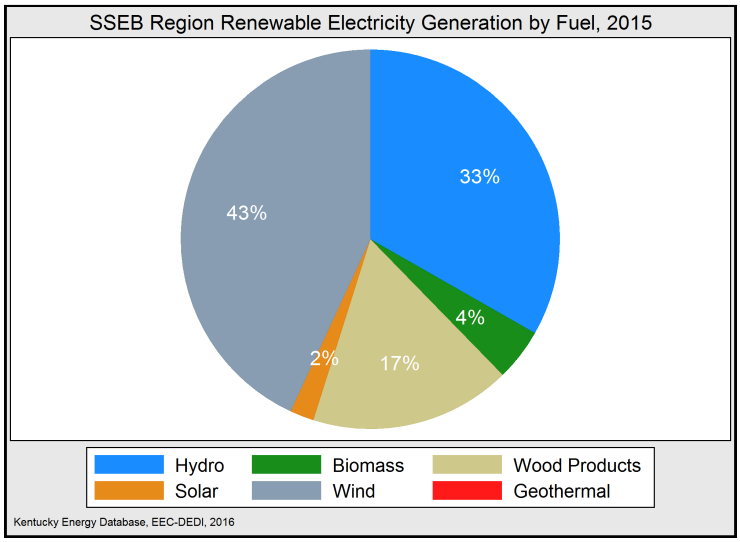


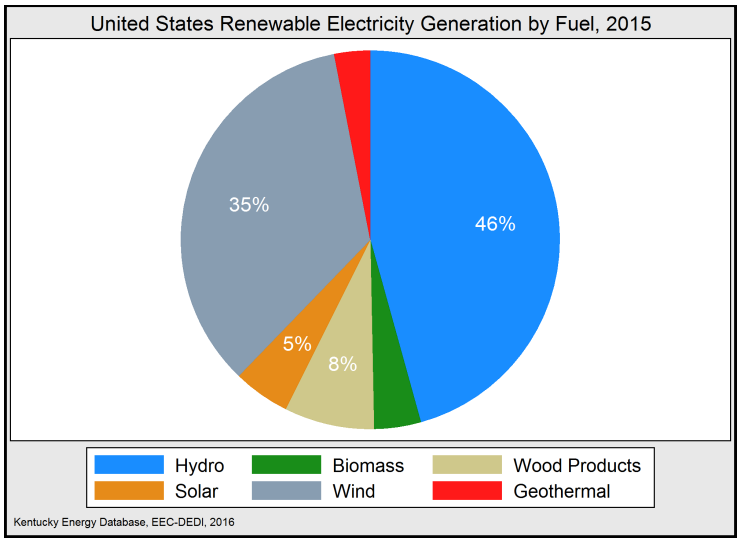



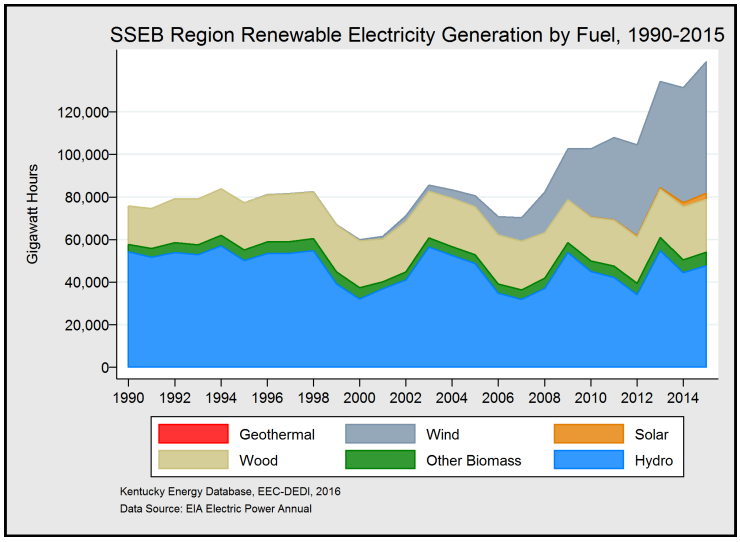
# SSEB Renewable Electricity Generation

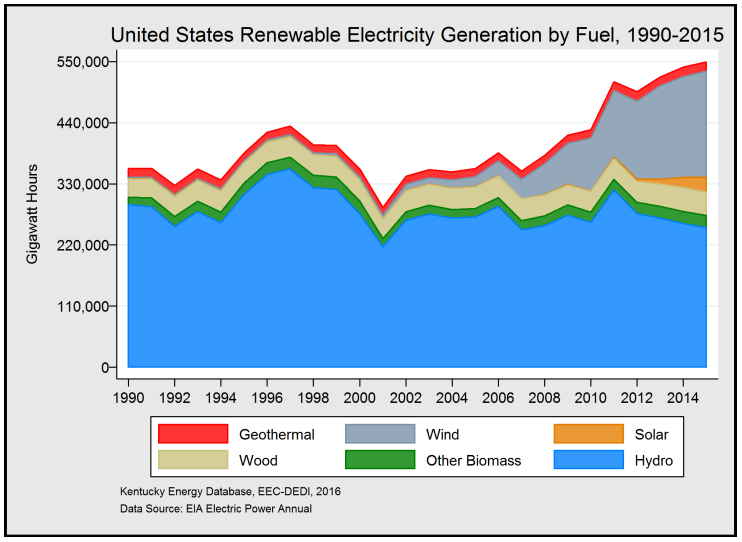



| Fuel Type | Gigawatt-hours | 2015 Change |
|---|---|---|
| Total | 168,388 | +7.7% |
| Hydroelectric | 47,787 | +7.5% |
| Wind | 61,867 | +14.2% |
| Wood Products | 24,715 | -0.9% |
| Biomass | 6,365 | +4.5% |
| Solar | 2,940 | +66.8% |

| Fuel Type | Gigawatt-hours | 2015 Change |
|---|---|---|
| Total | 544,433 | +2.0% |
| Hydroelectric | 251,169 | -2.9% |
| Wind | 190,927 | +5.0% |
| Wood Products | 42,358 | -1.61% |
| Solar | 26,473 | +44.5% |
| Biomass | 21,833 | +2.7% |

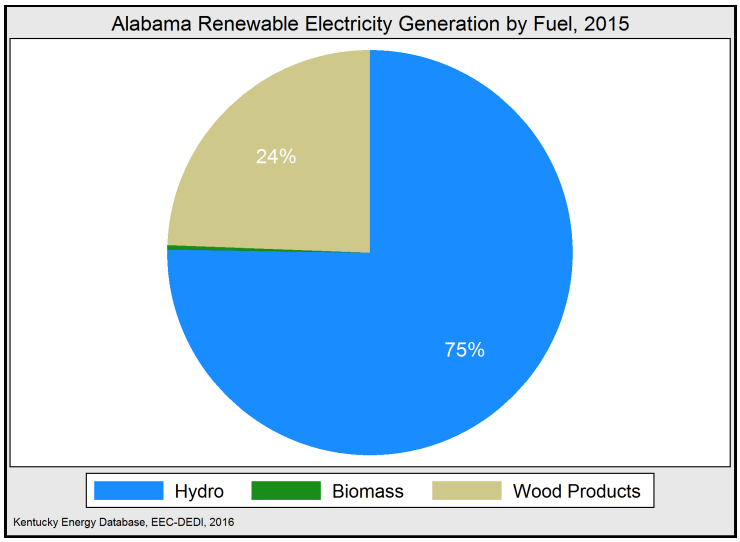


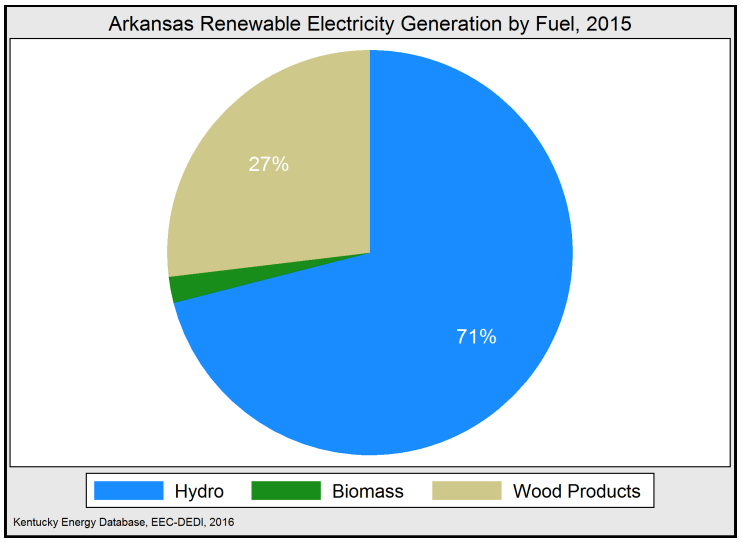



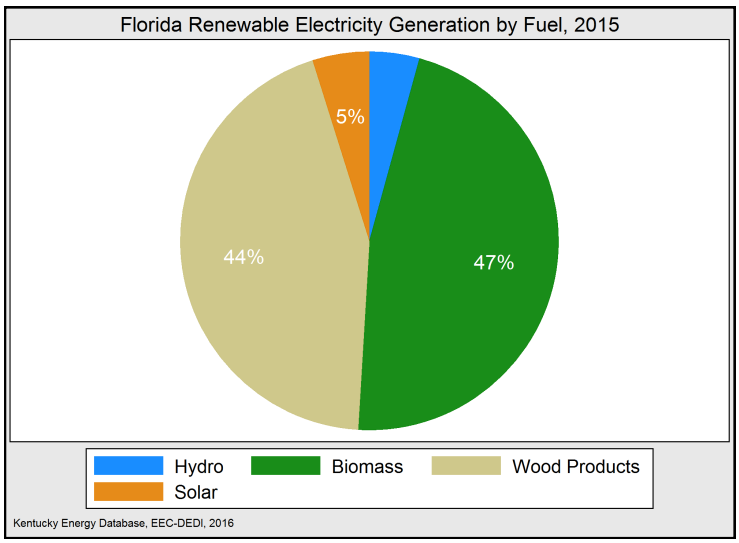

Renewable electricity generation increased by 17 percent in the SSEB region in 2015. Wind power was the fastest growing renewable technology by electricity output in the SSEB region, generating nearly 62 TWh in 2015, a 14 percent increase. Wind generation became the largest source of renewable electricity, 43 percent in 2015. The combustion of wood and other biomass make up the region's third and fourth largest renewable energy resources. Solar generation exhibited the largest proportional gain at 67 percent.

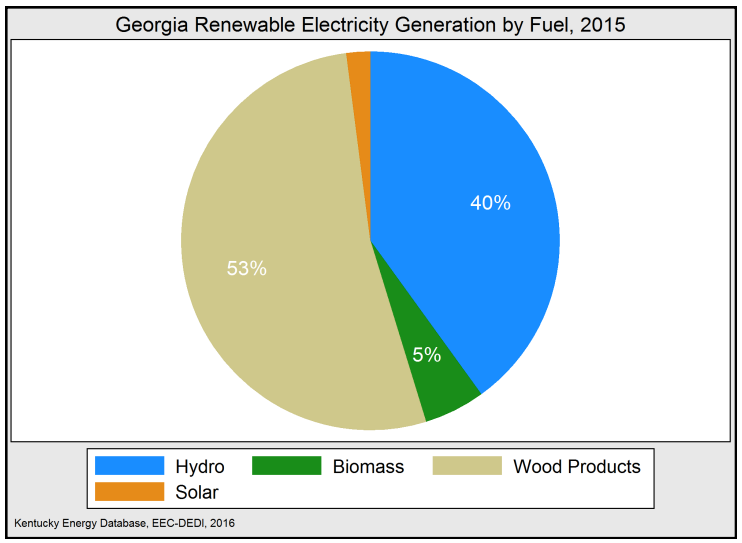
Renewable electricity generation in the United States has risen by 48 percent since 2008 to 562 TWh in 2015. Although hydroelectric energy constitutes 45 percent and wind constitutes 34 percent of renewable energy, solar generation is the fastest growing, producing 38.6 TWh in 2015, a 42 percent increase. Wood and other biomass accounted for 12 percent of total renewables.

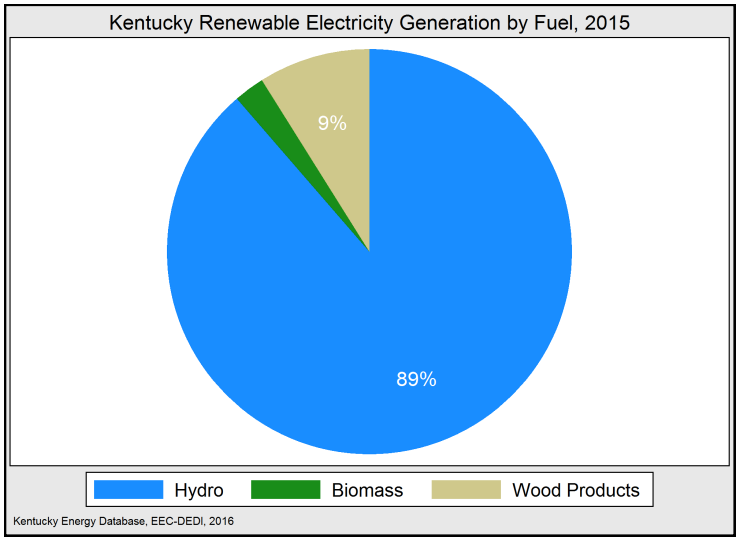
# Renewable Electricity Generation

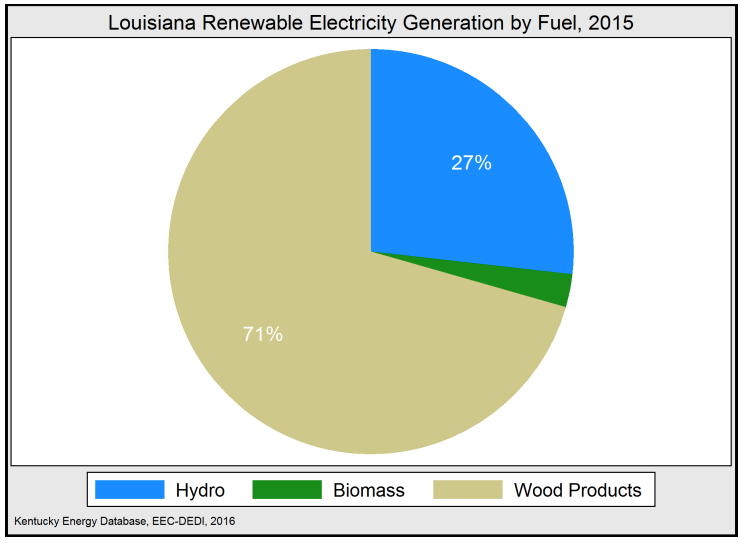


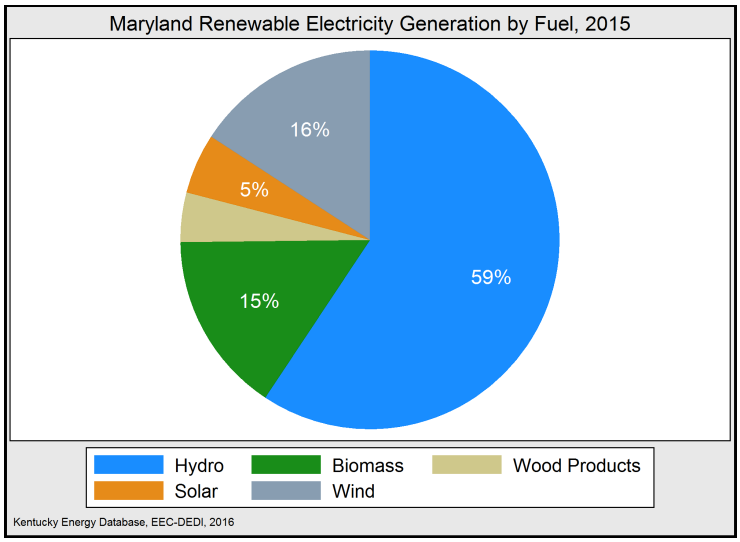



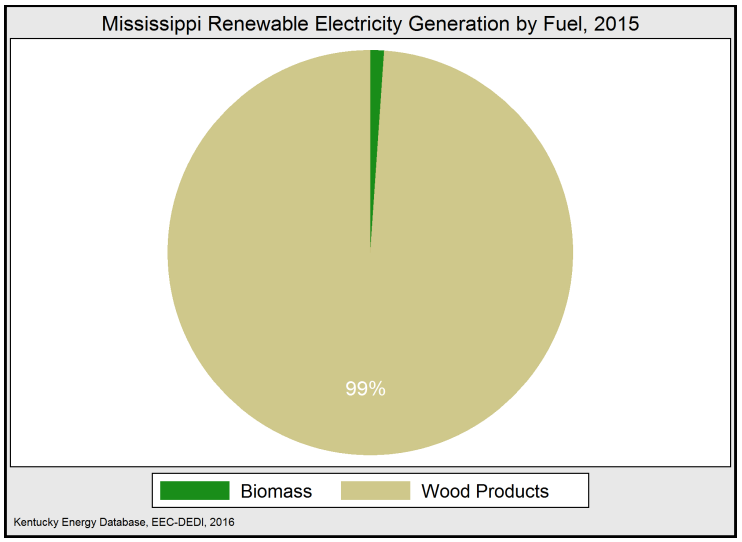



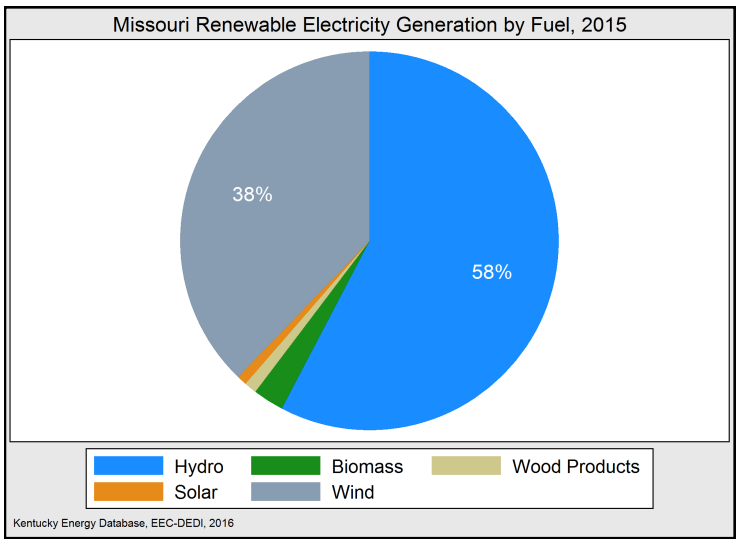



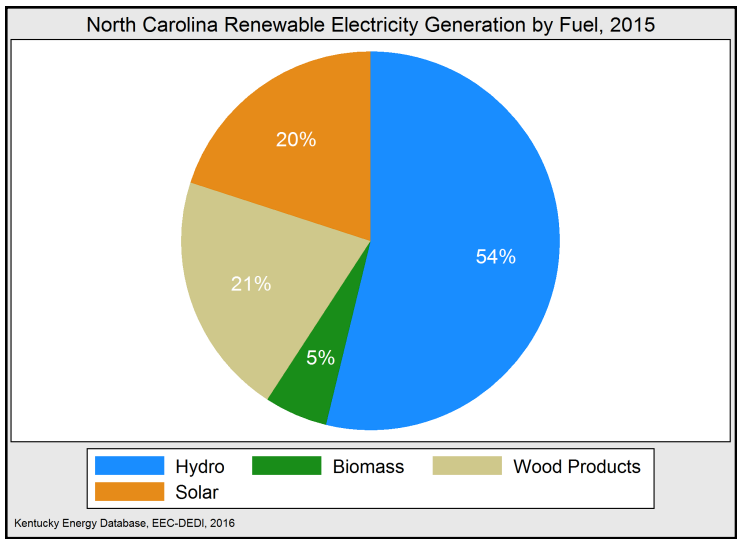



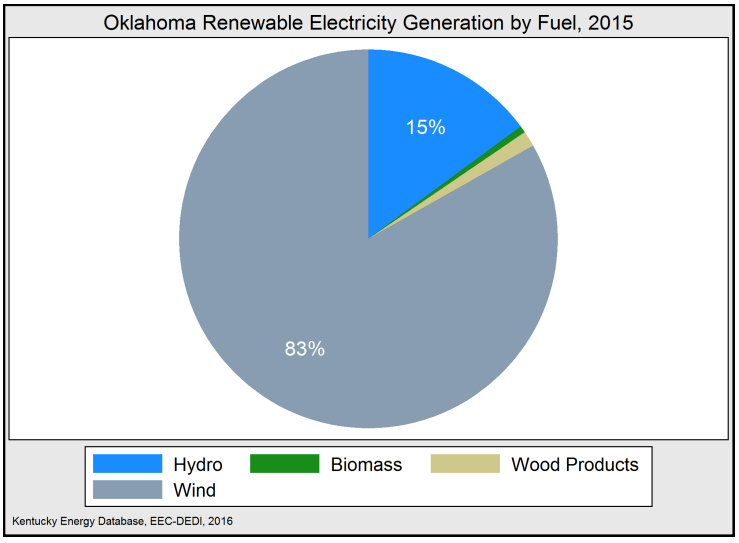
# Renewable Electricity Generation

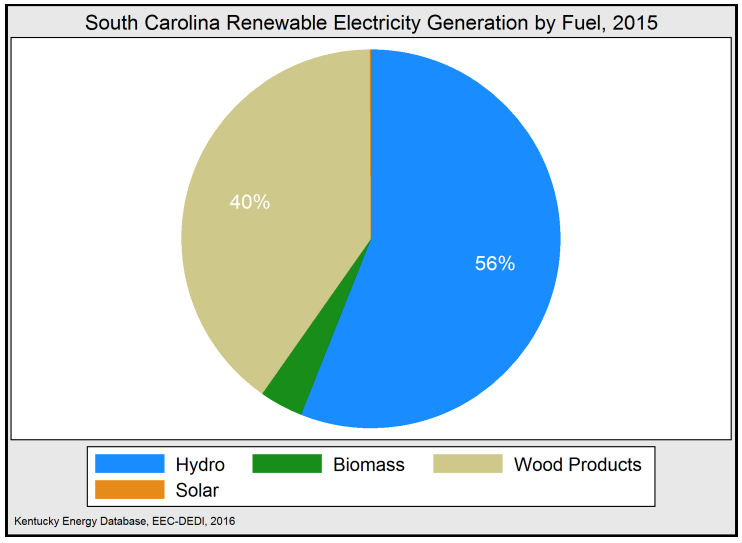


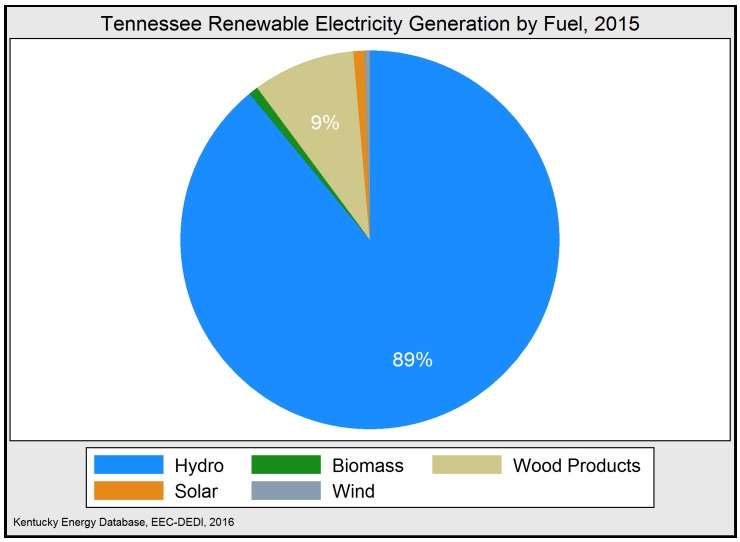



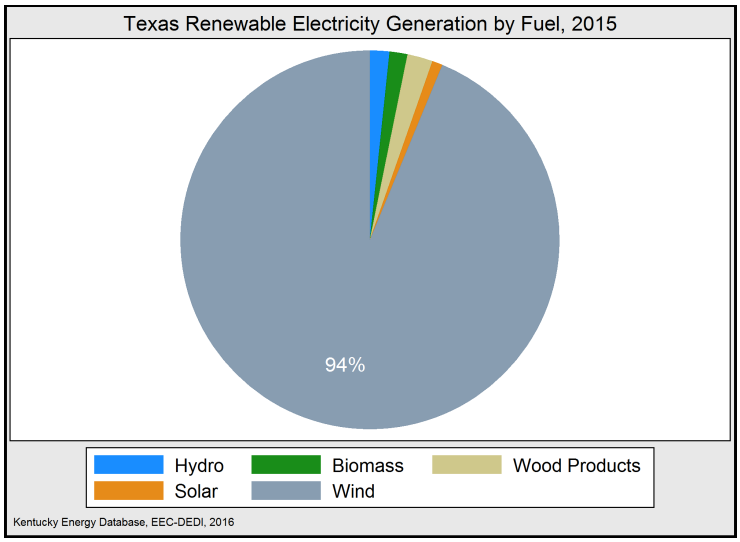



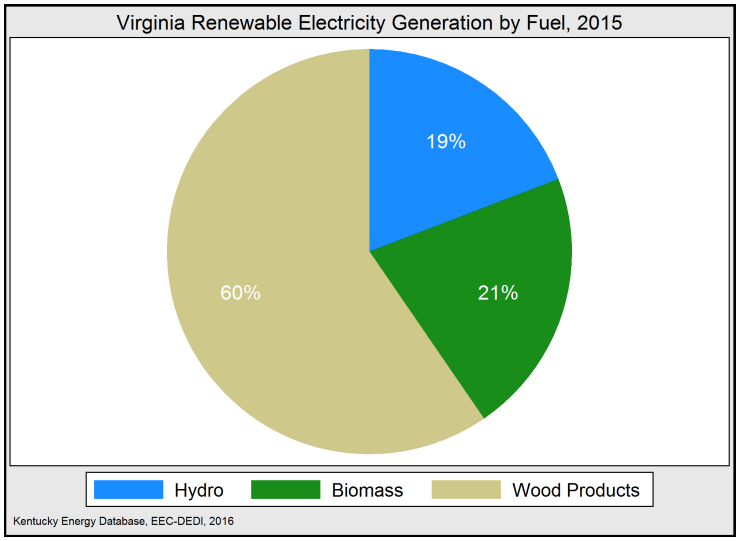



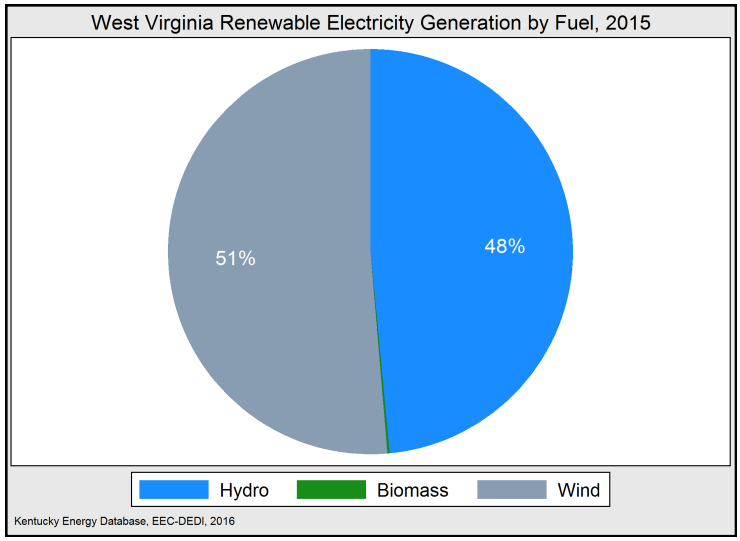



# Renewable Electricity Generation

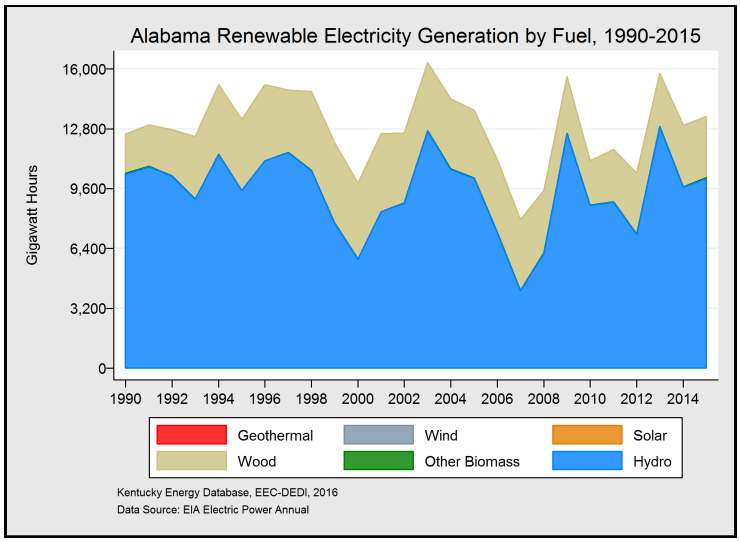


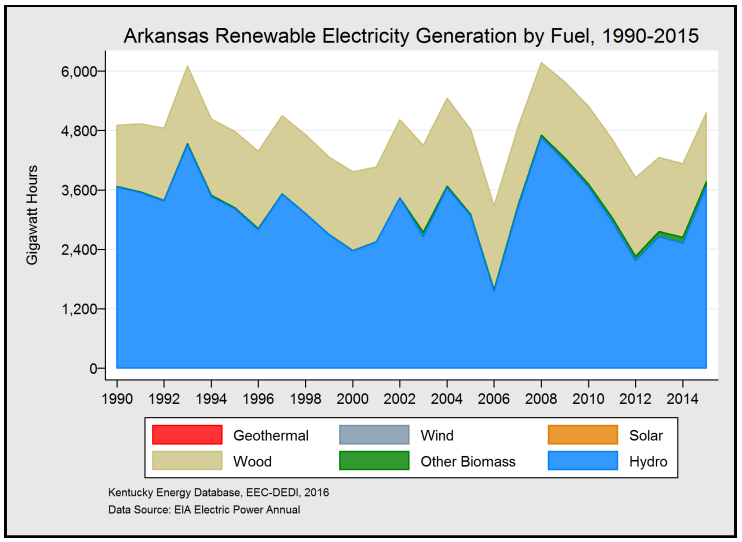



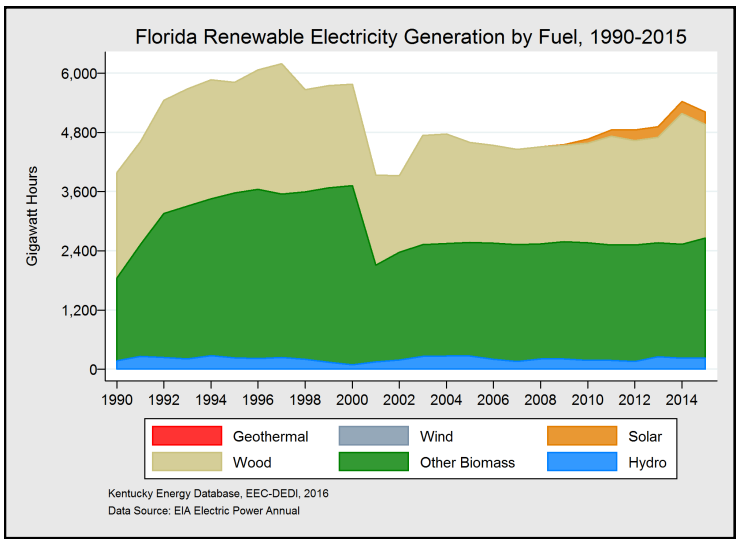



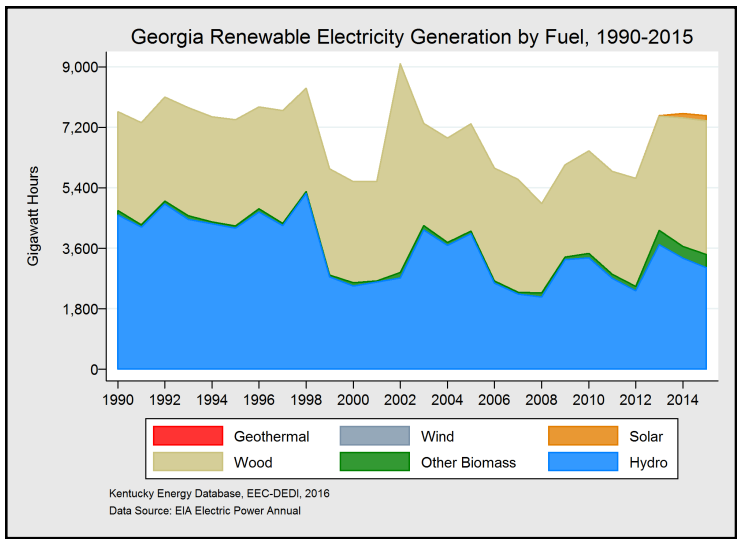



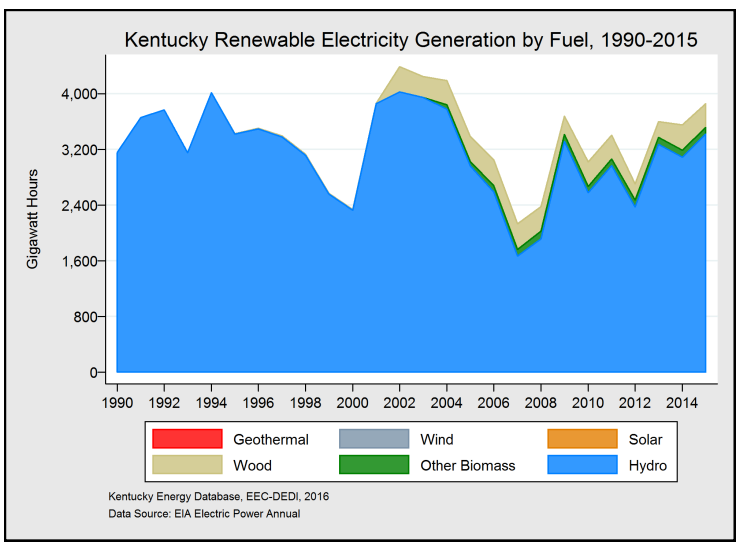
# Historical Renewable Electricity Generation

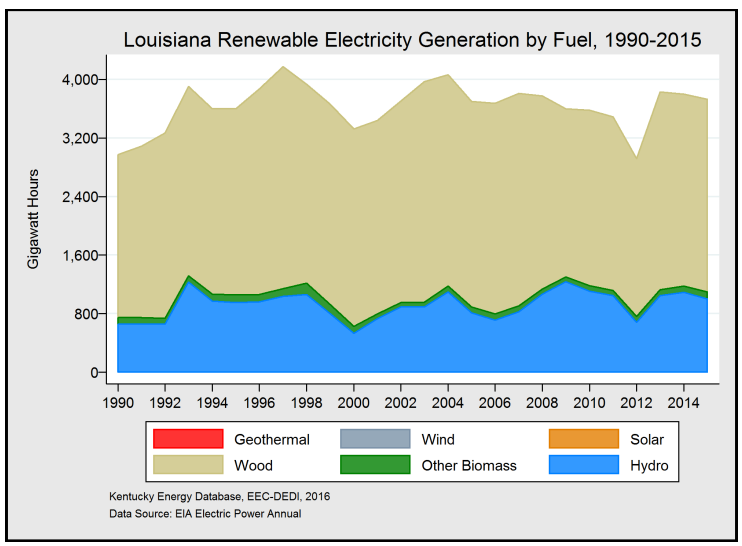


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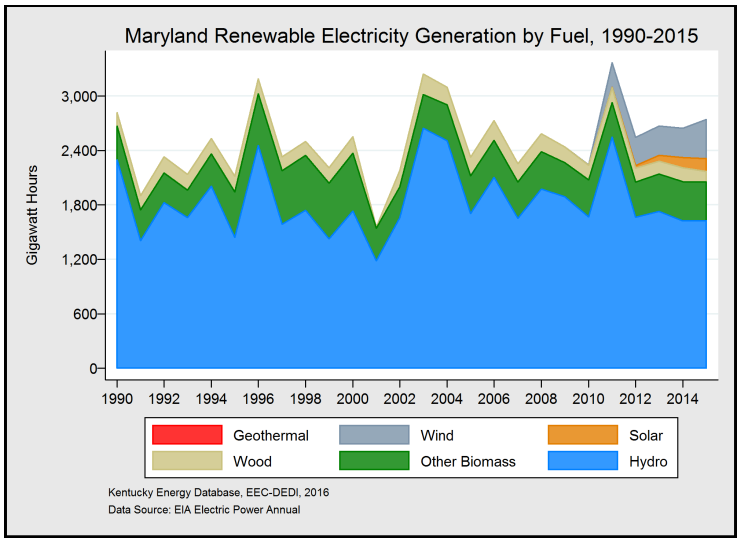
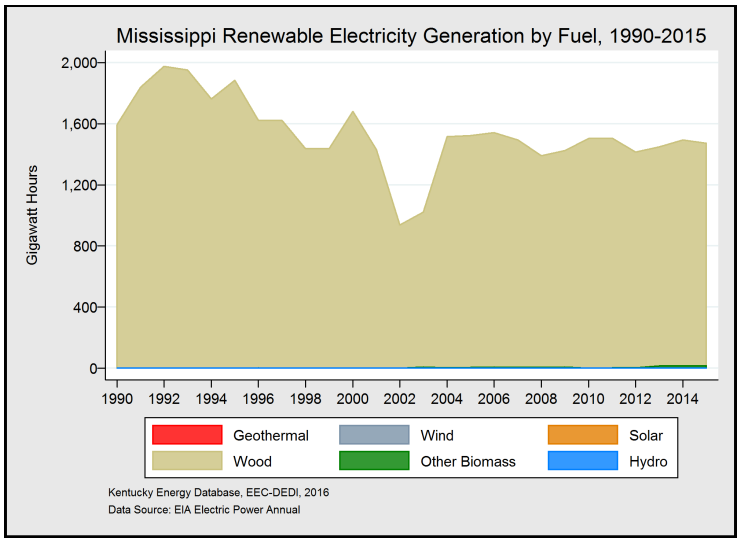
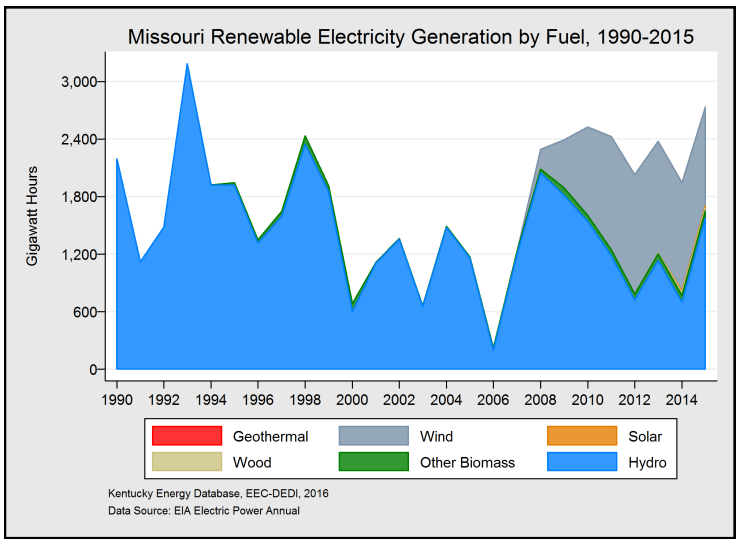
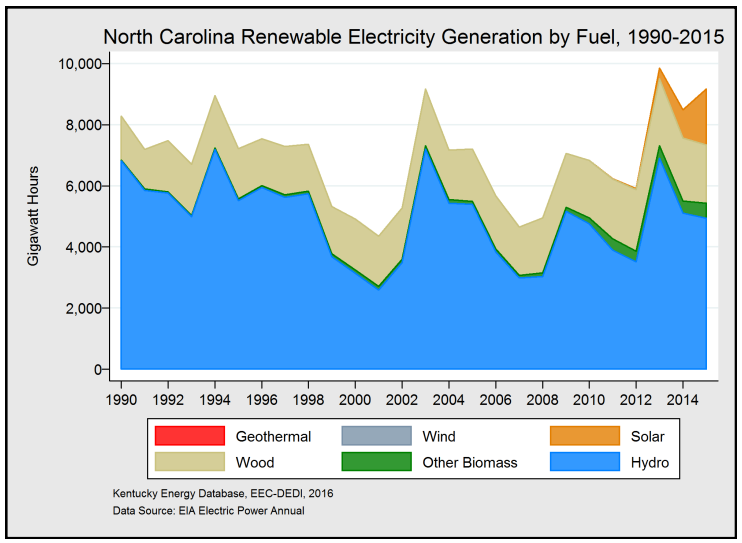
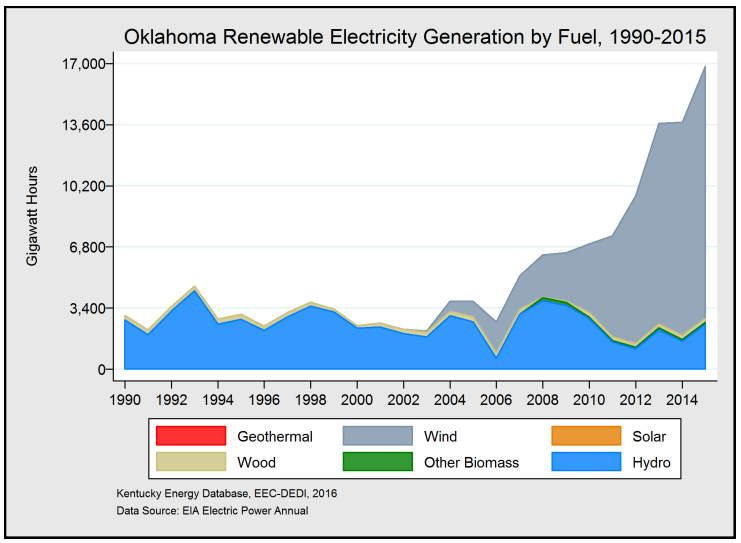
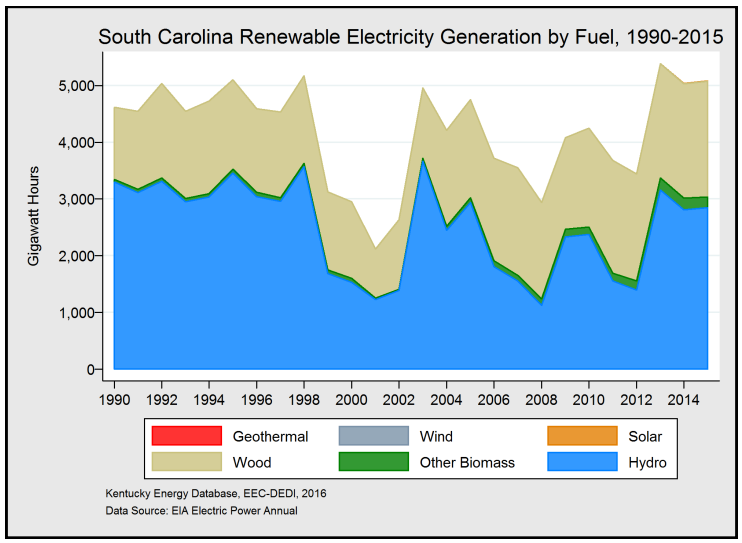


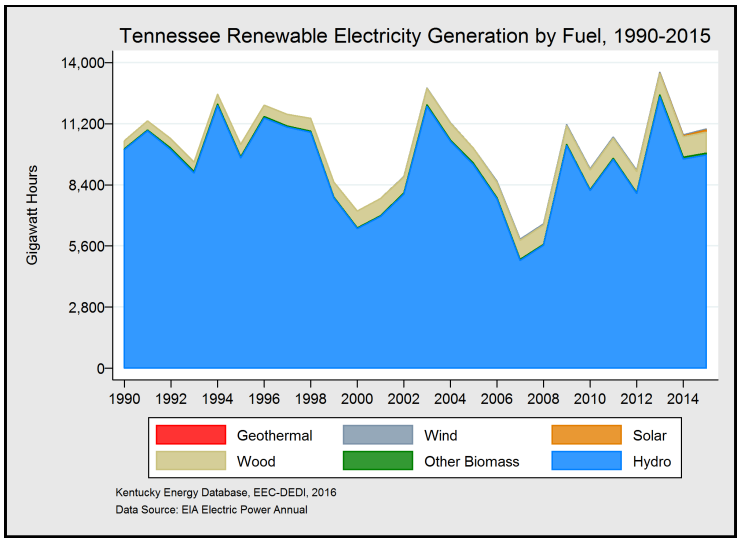



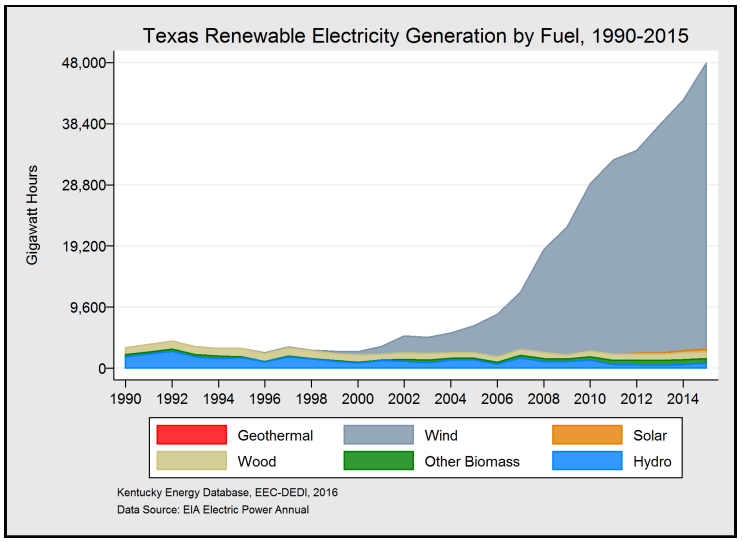



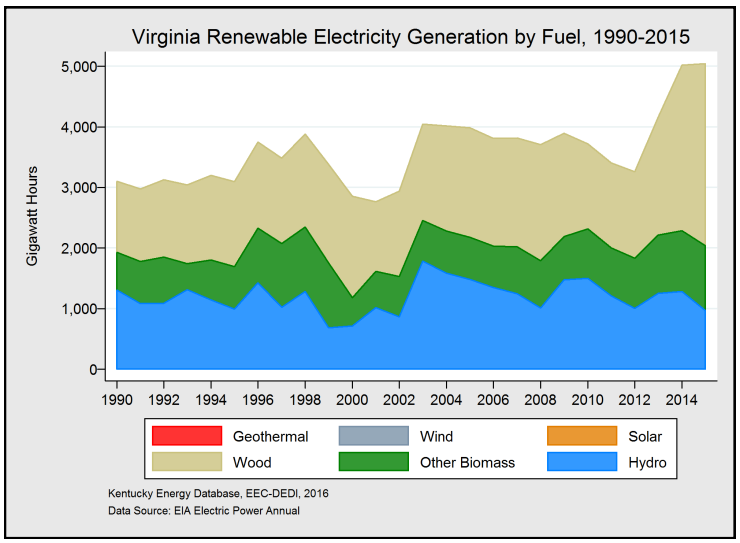



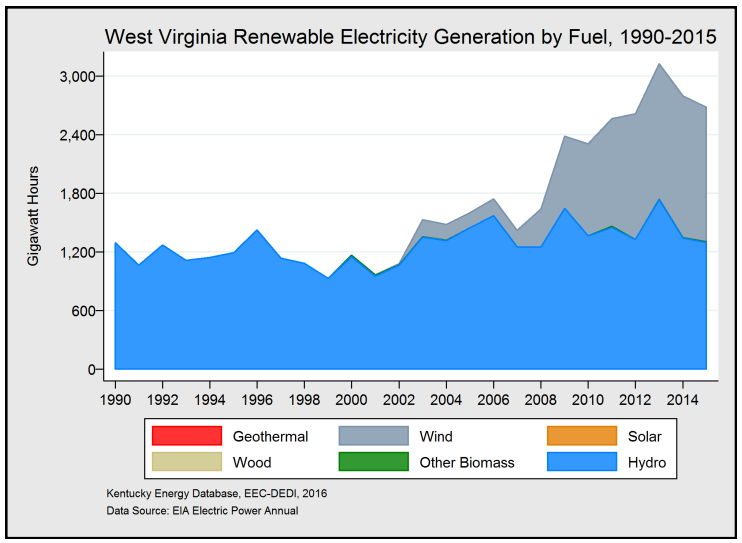



# Historical Renewable Electricity Generation

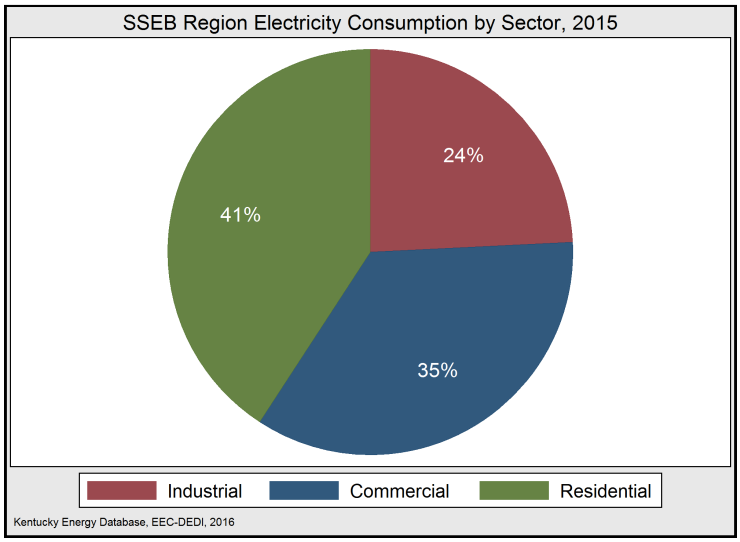


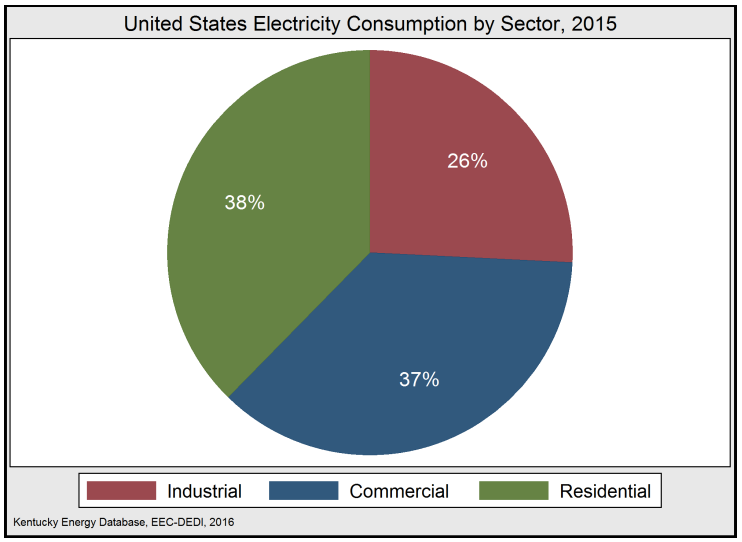



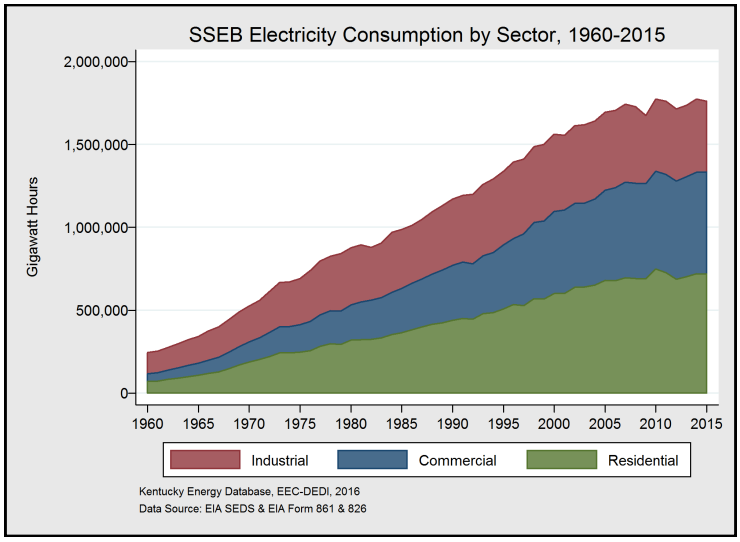
# SSEB Region Electricity Consumption

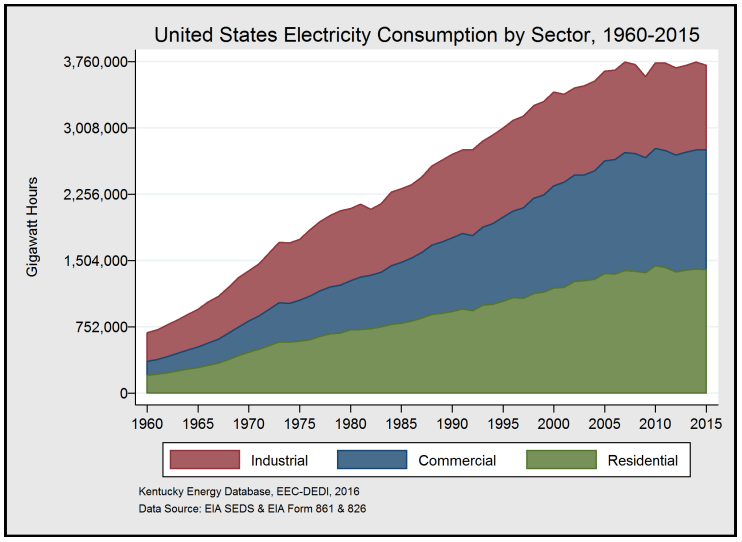



| Sector | Gigawatt-hours | 2015 Change |
|---|---|---|
| Total | 1,760,544 | -0.7% |
| Residential | 718,452 | -0.3% |
| Commercial | 615,509 | +0.8% |
| Industrial | 426,583 | -3.5% |

| Sector | Gigawatt-hours | 2015 Change |
|---|---|---|
| Total | 3,724,525 | -<0.1% |
| Residential | 1,399,884 | +1.2% |
| Commercial | 1,358,419 | +0.8% |
| Industrial | 966,222 | -3.2% |

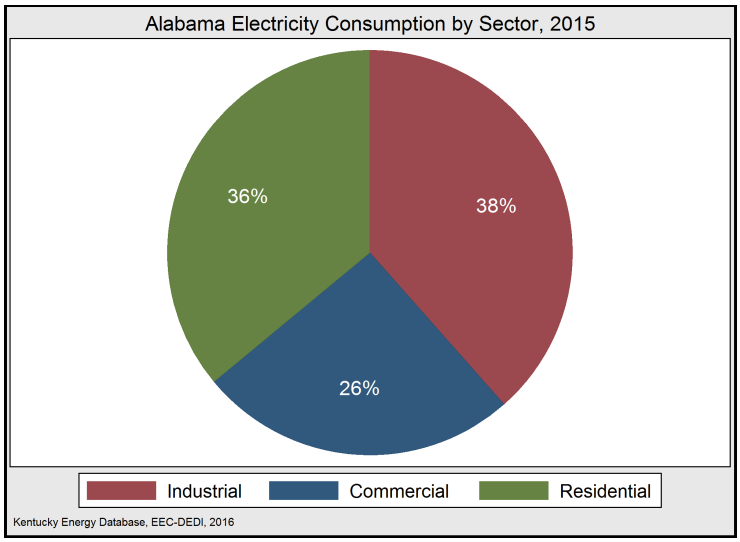


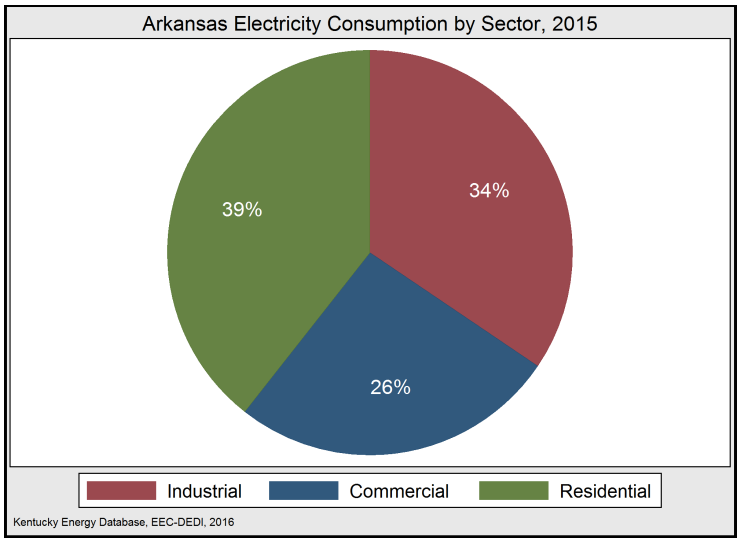



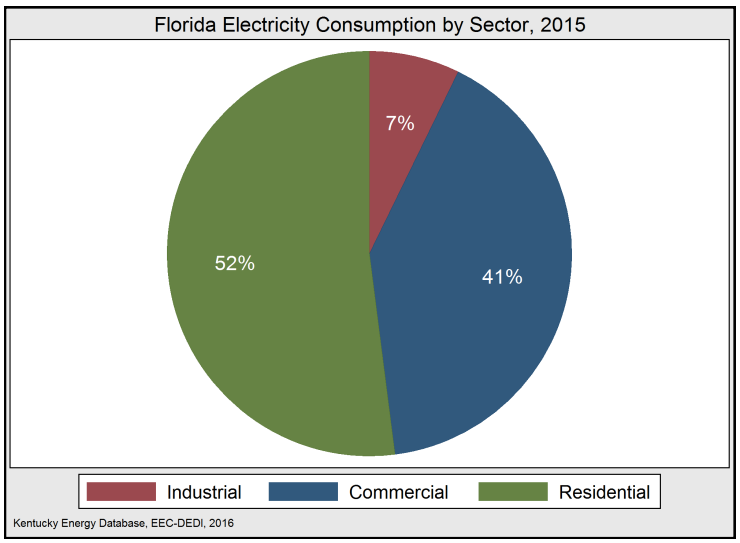

Electricity consumption across the SSEB region declined by 0.7 percent in 2015, while elsewhere in the United Sates, electricity consumption declined by a marginal 0.1 percent. Industrial and residential consumption declined by 3.5 and 0.3 percent respectively in 2015, while commercial consumption increased by 0.8 percent. In 2015, industrial consumers in the SSEB region accounted for 24 percent of demand compared to 26 percent nationally.

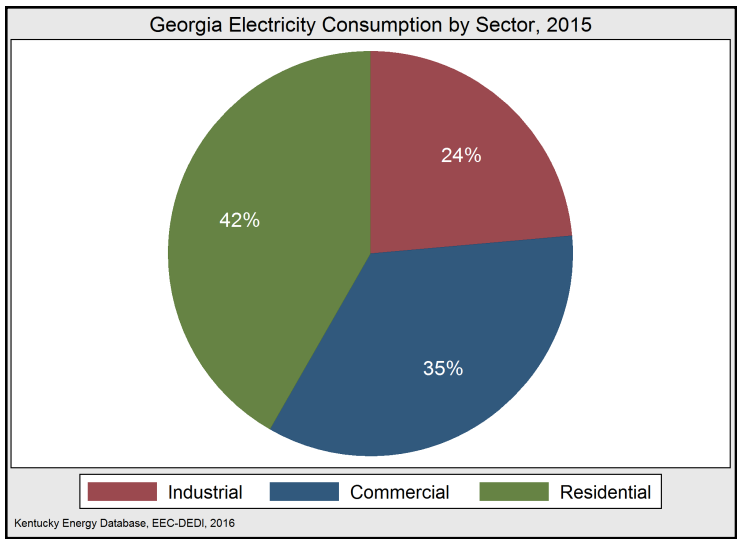
Industrial electricity demand was once the largest consuming sector; however industrial demand in the SSEB region continues to decline, decreasing 3.5 percent in 2015 and 10 percent since peaking in 2000. Since the mid-1980s, residential demand continues to account for the largest proportion of electricity consumption in both the SSEB region, 41 percent, and the United States, at 38 percent.

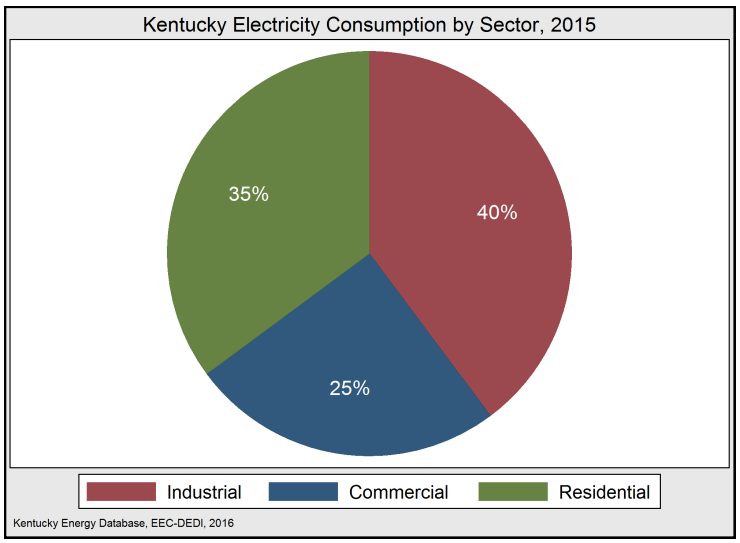
# Electricity Consumption by Sector

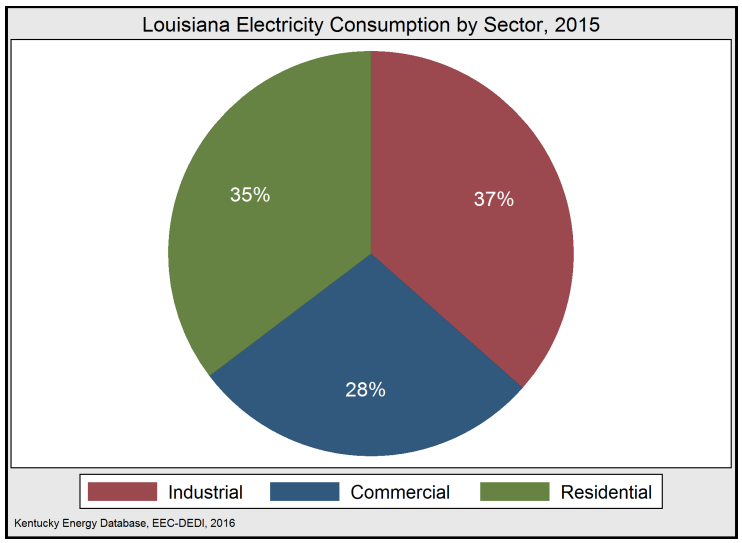


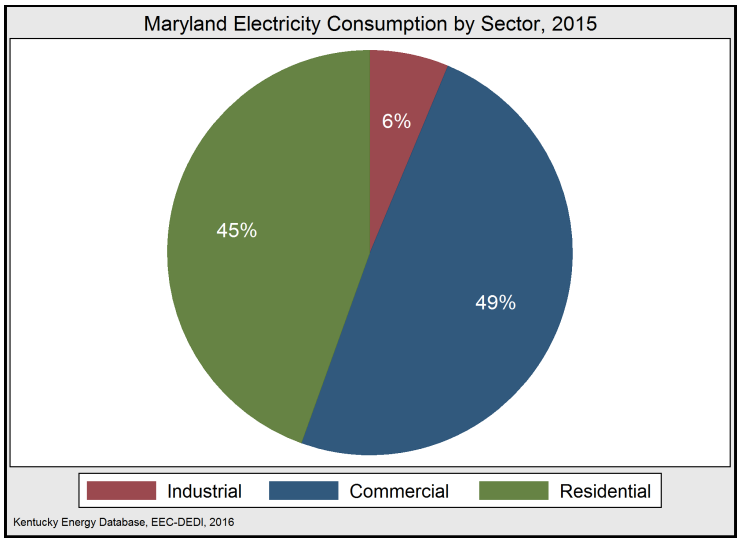



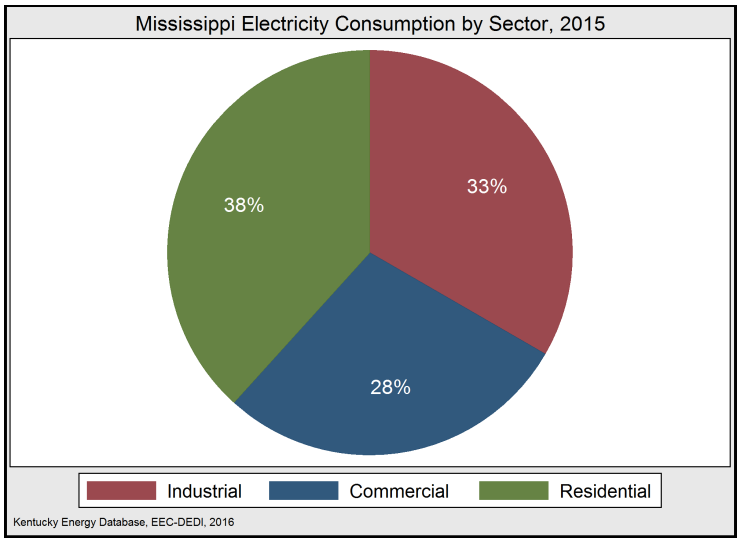



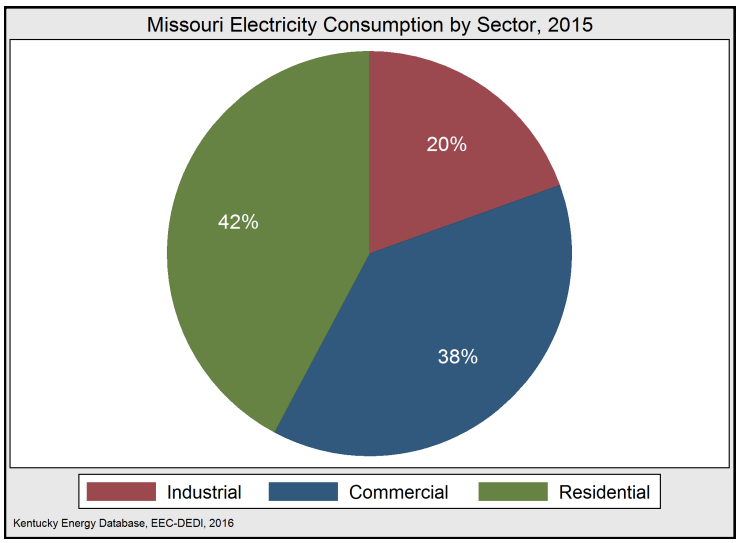



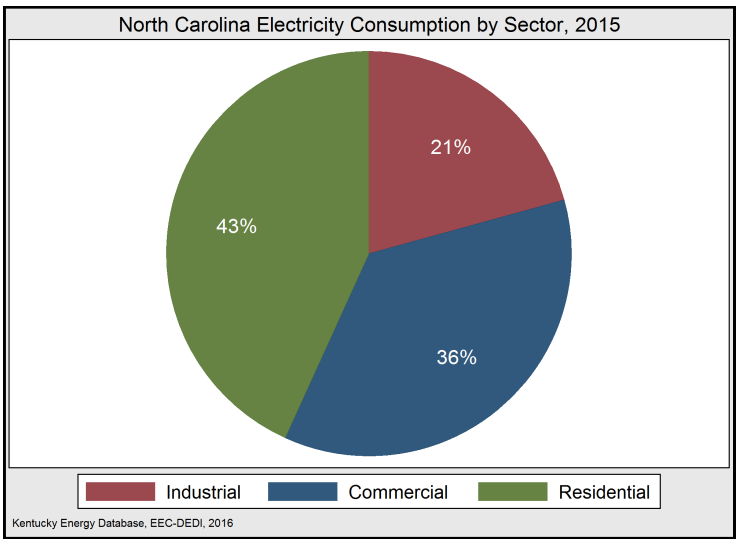



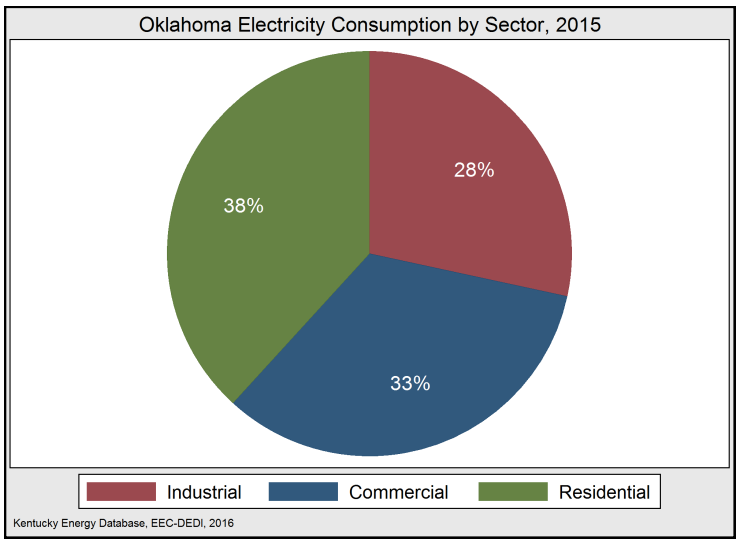
# Electricity Consumption by Sector

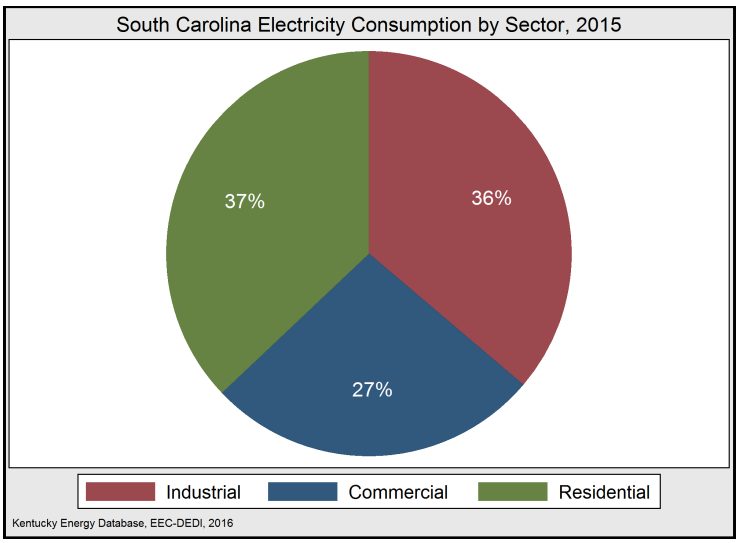


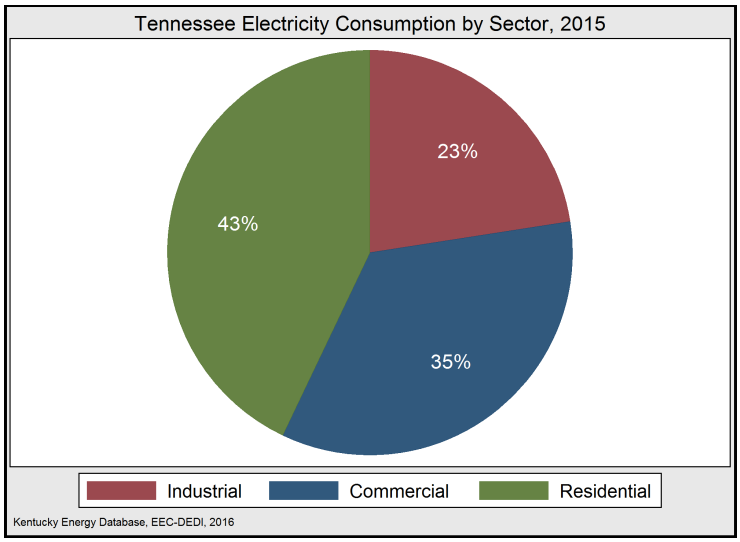



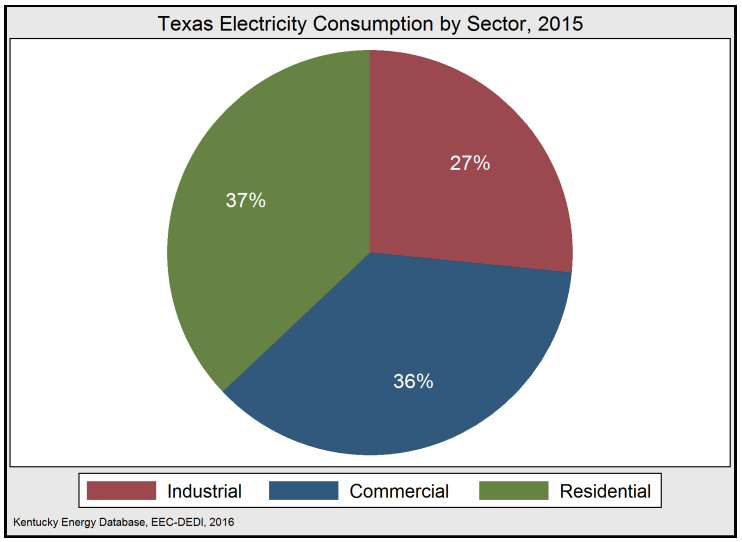



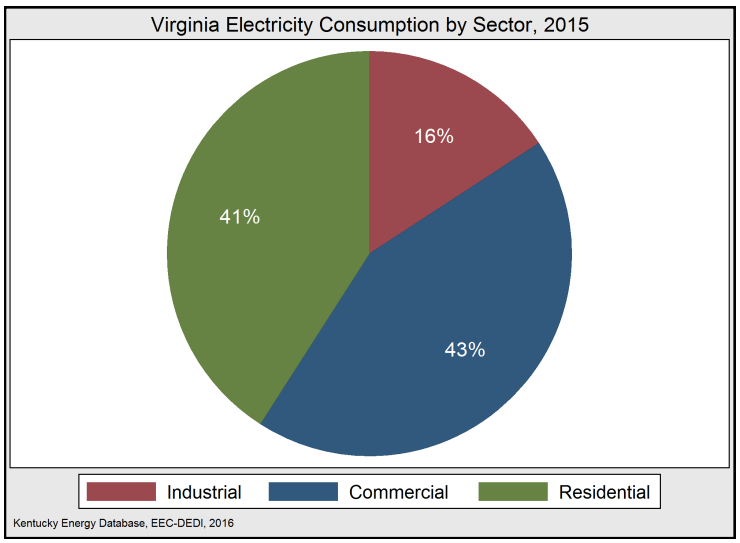



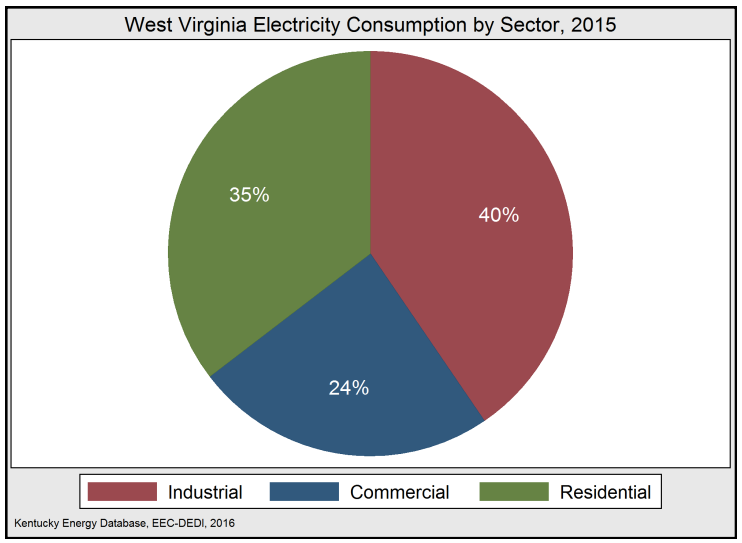



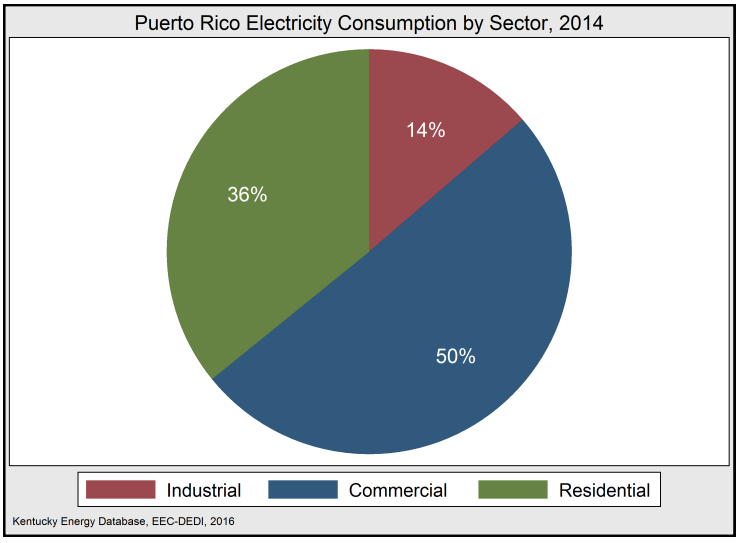
# Electricity Consumption by Sector

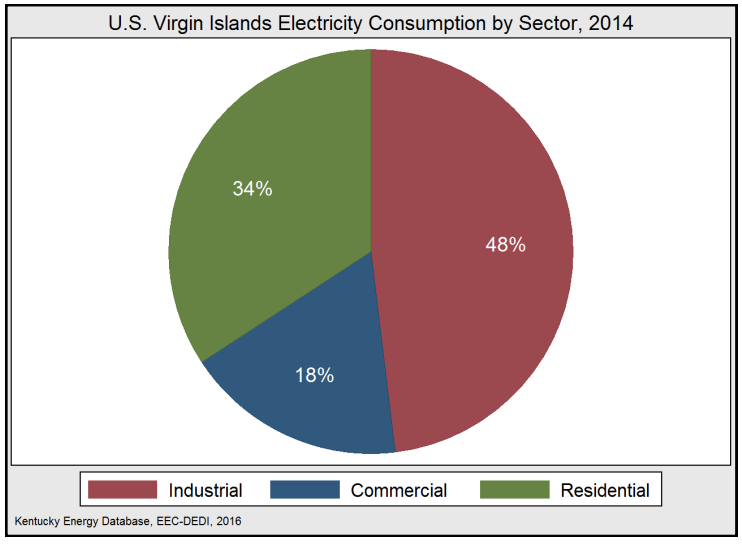


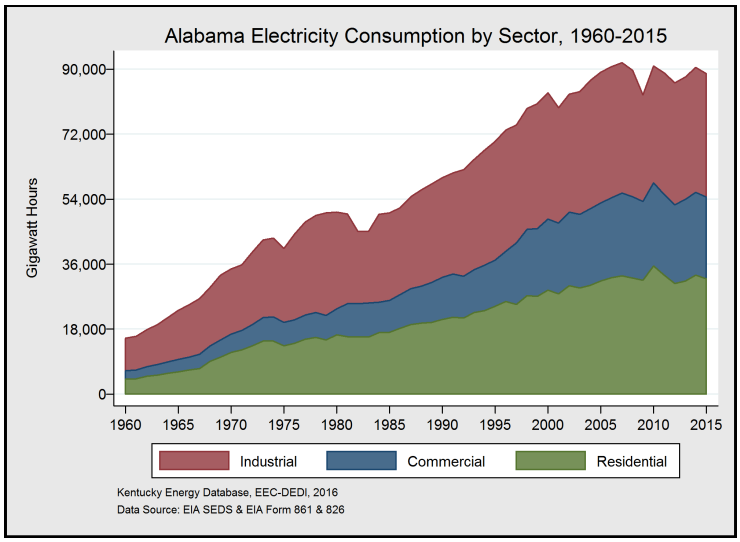



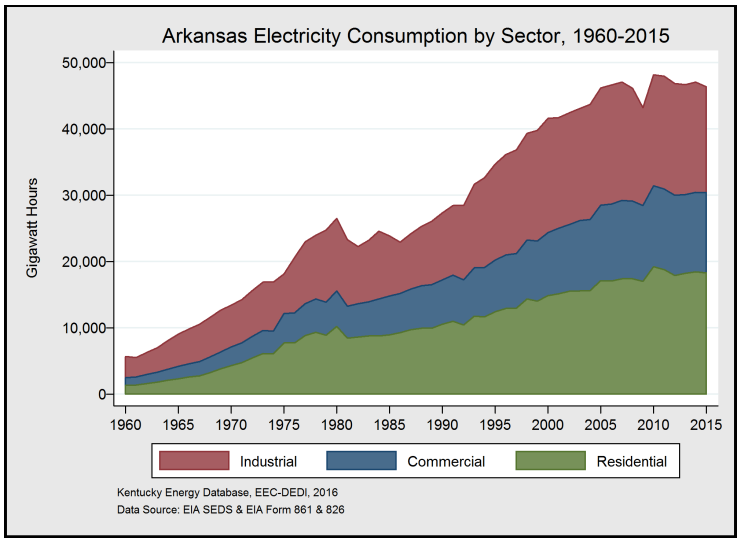



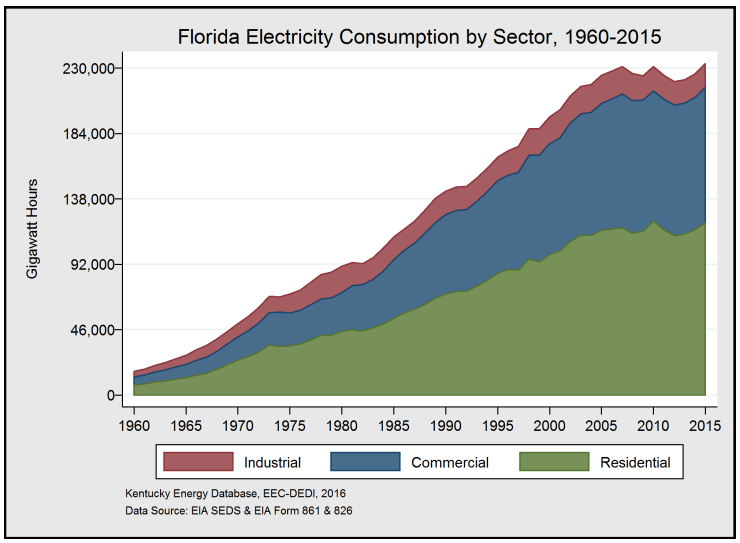



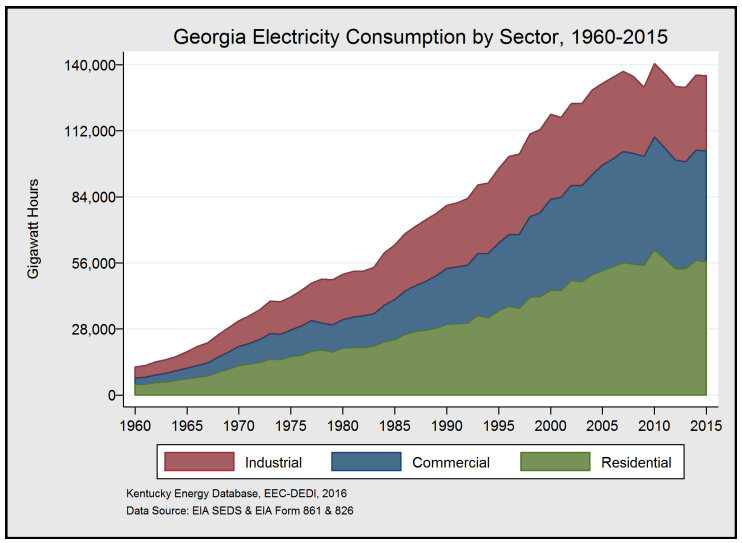



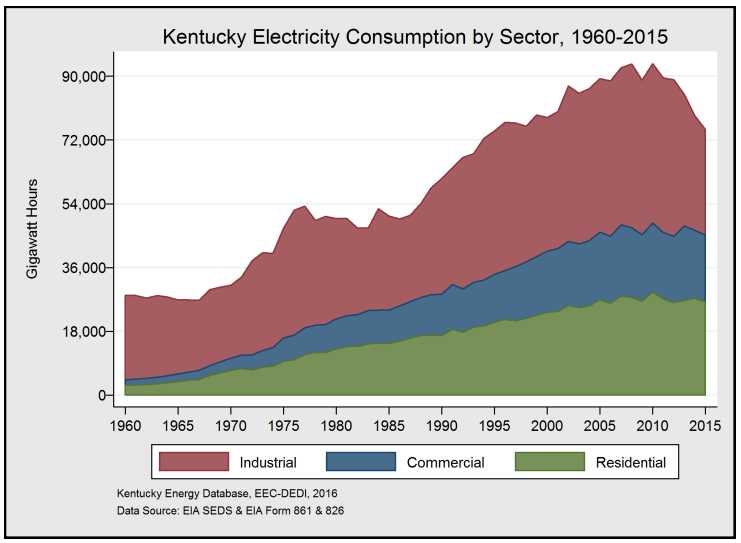
# Historical Electricity Consumption by Sector

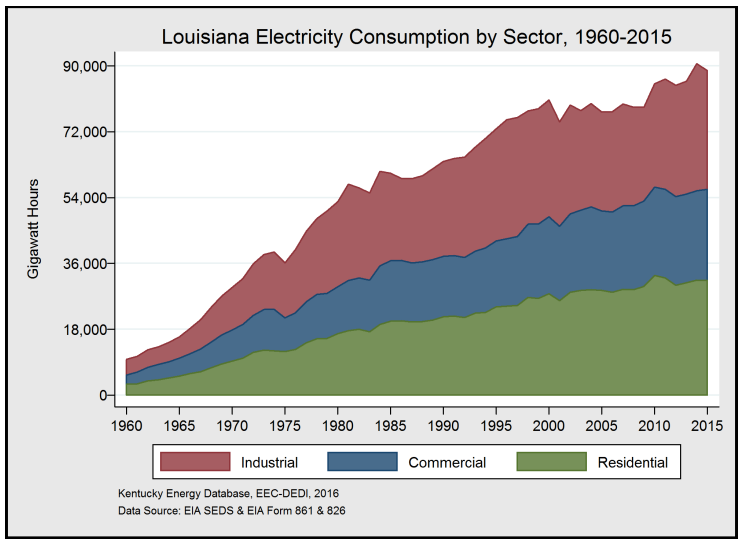


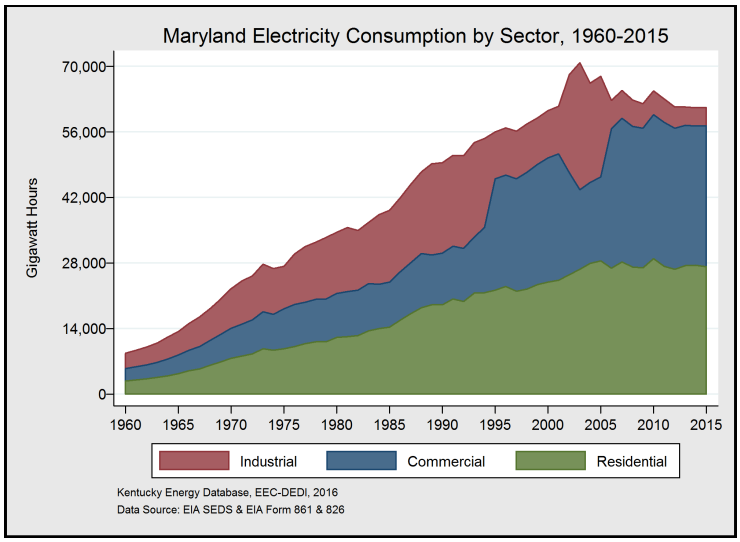



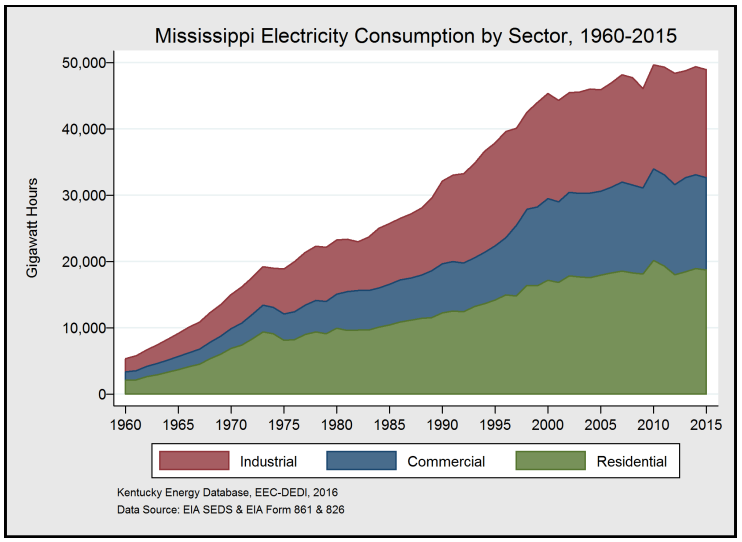



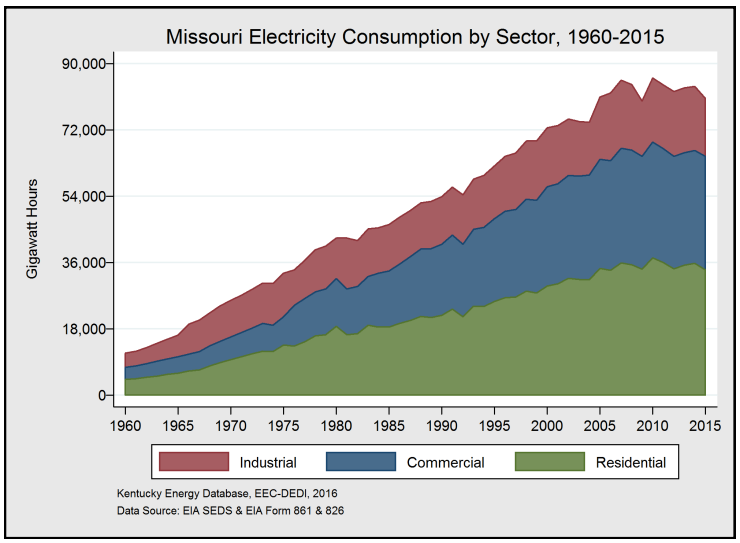



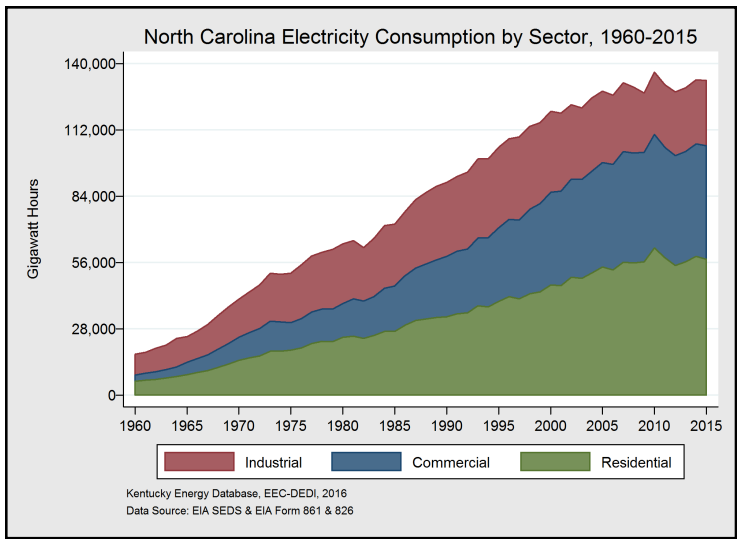



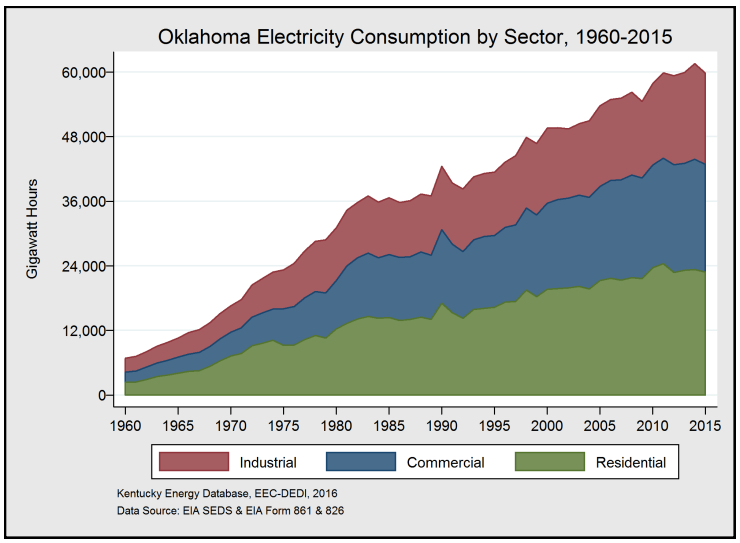
# Historical Electricity Consumption by Sector

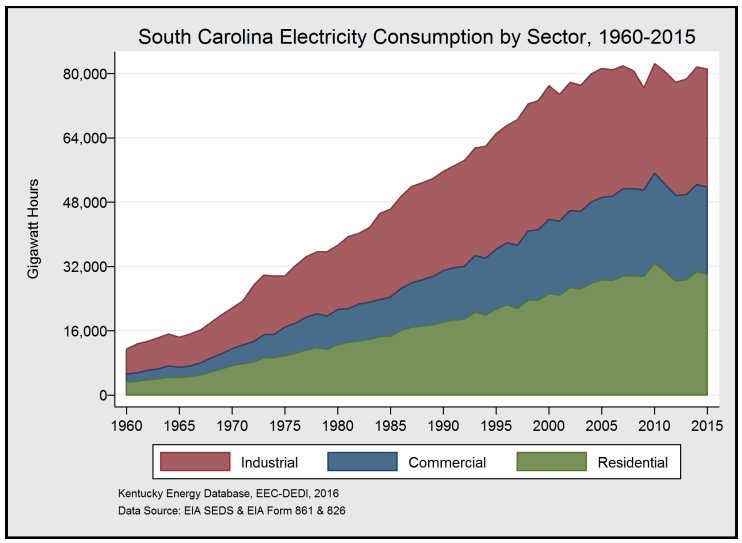


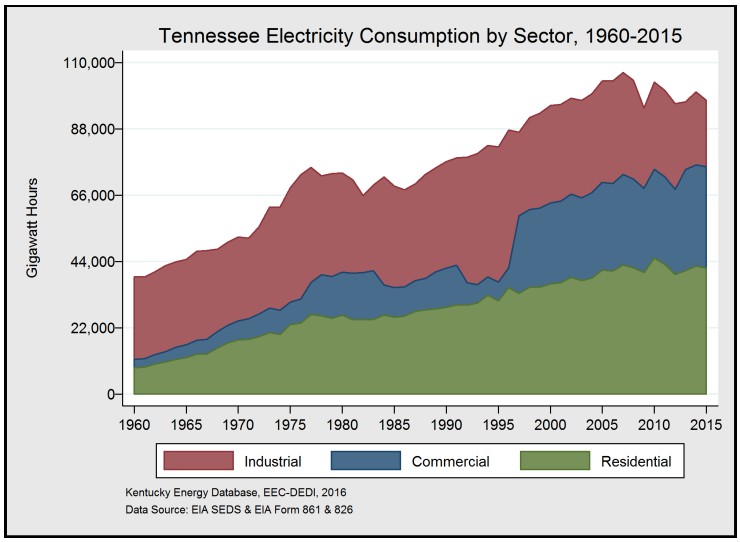



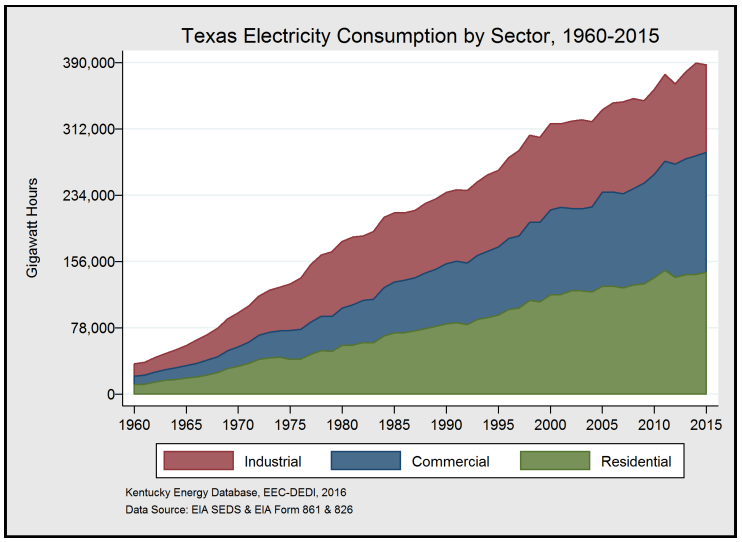



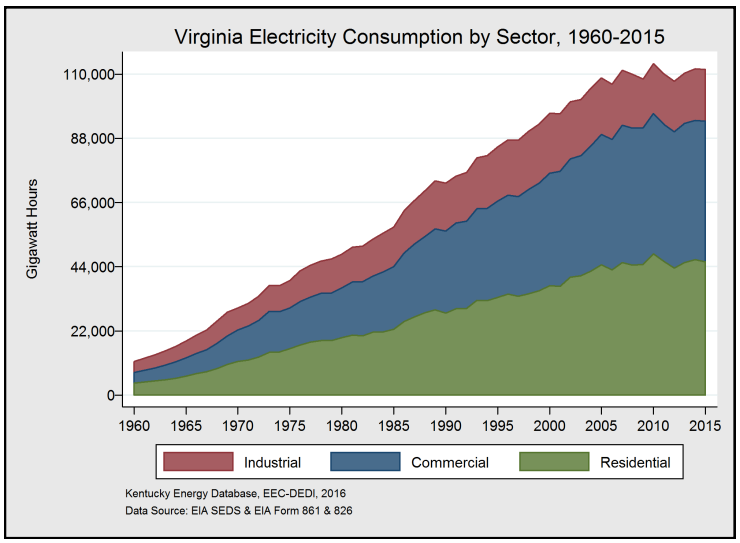



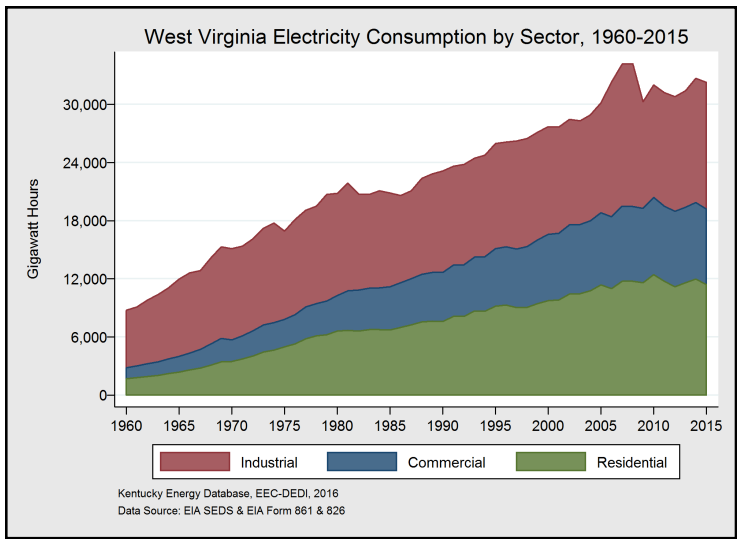



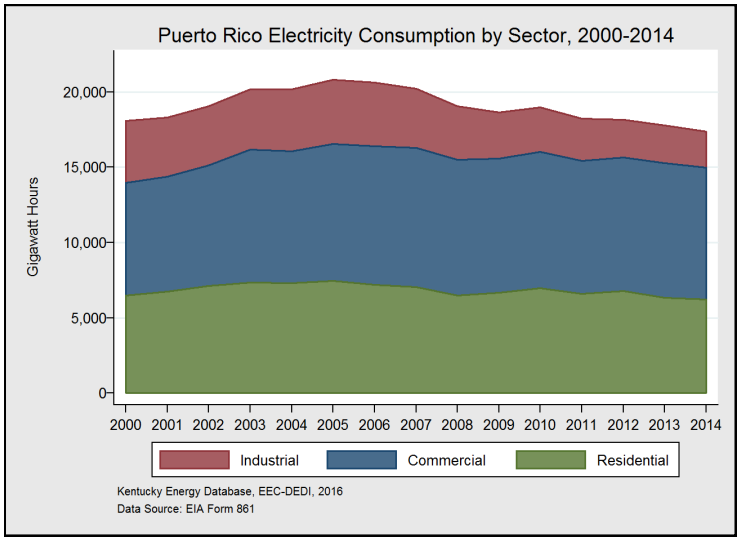
# Historical Electricity Consumption by Sector

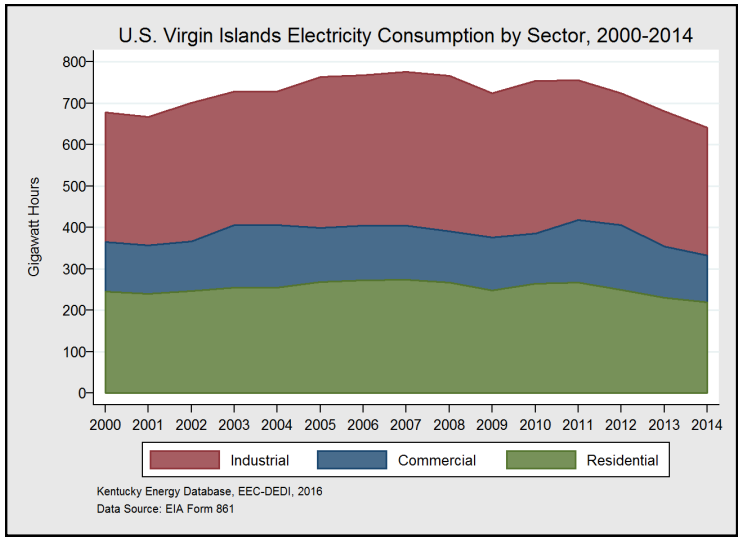


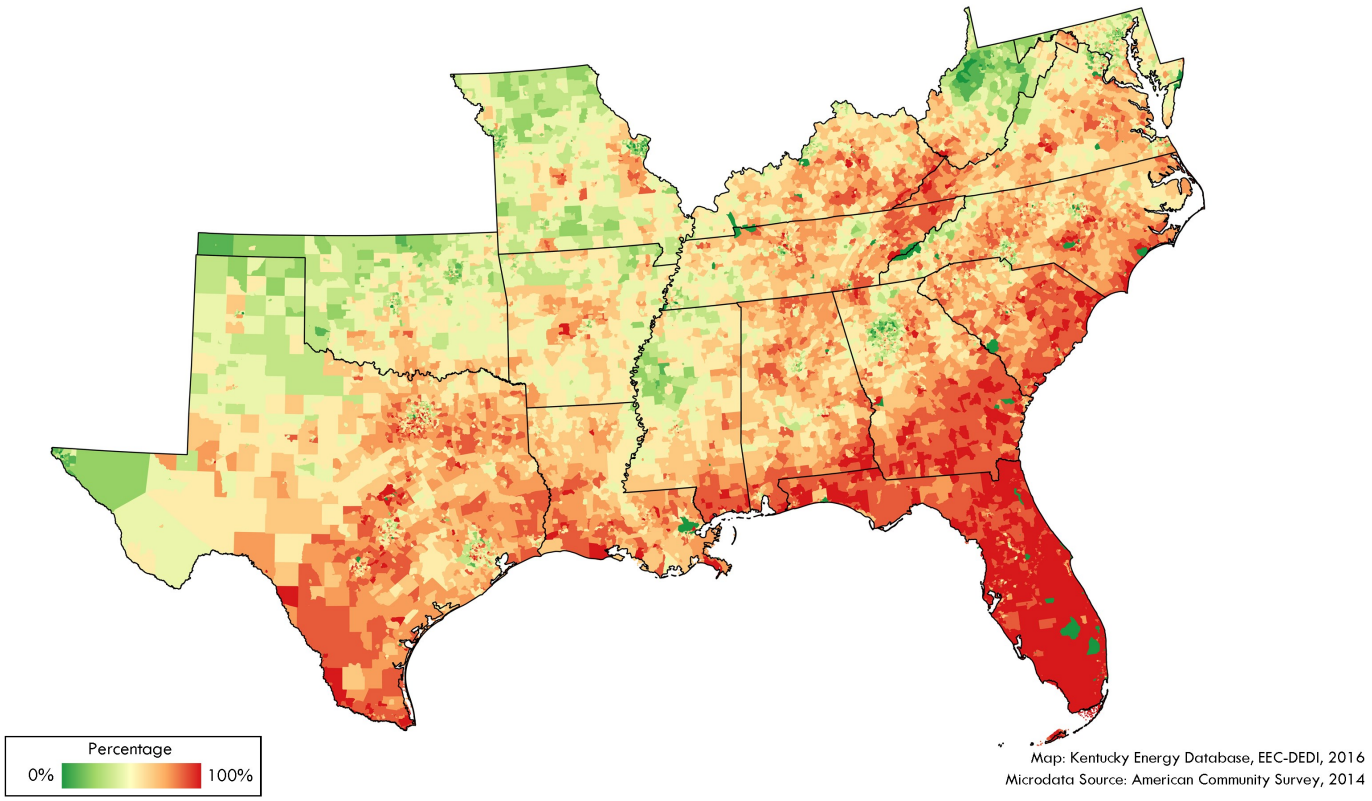



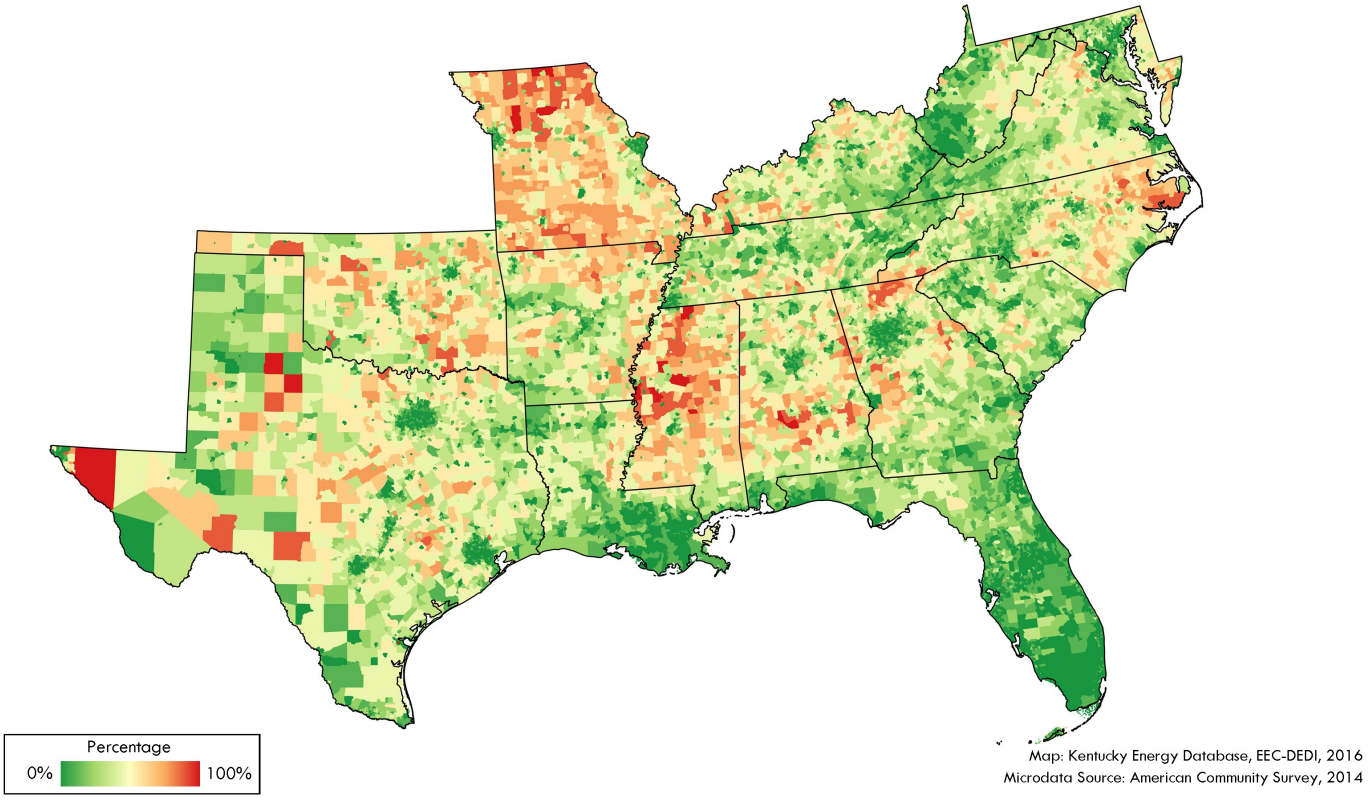
# Home Heating

## Homes Heating with Electricity in SSEB Region




Map: Kentucky Energy Database, EEC-DEDI, 2016
Microdata Source: American Community Survey, 2014

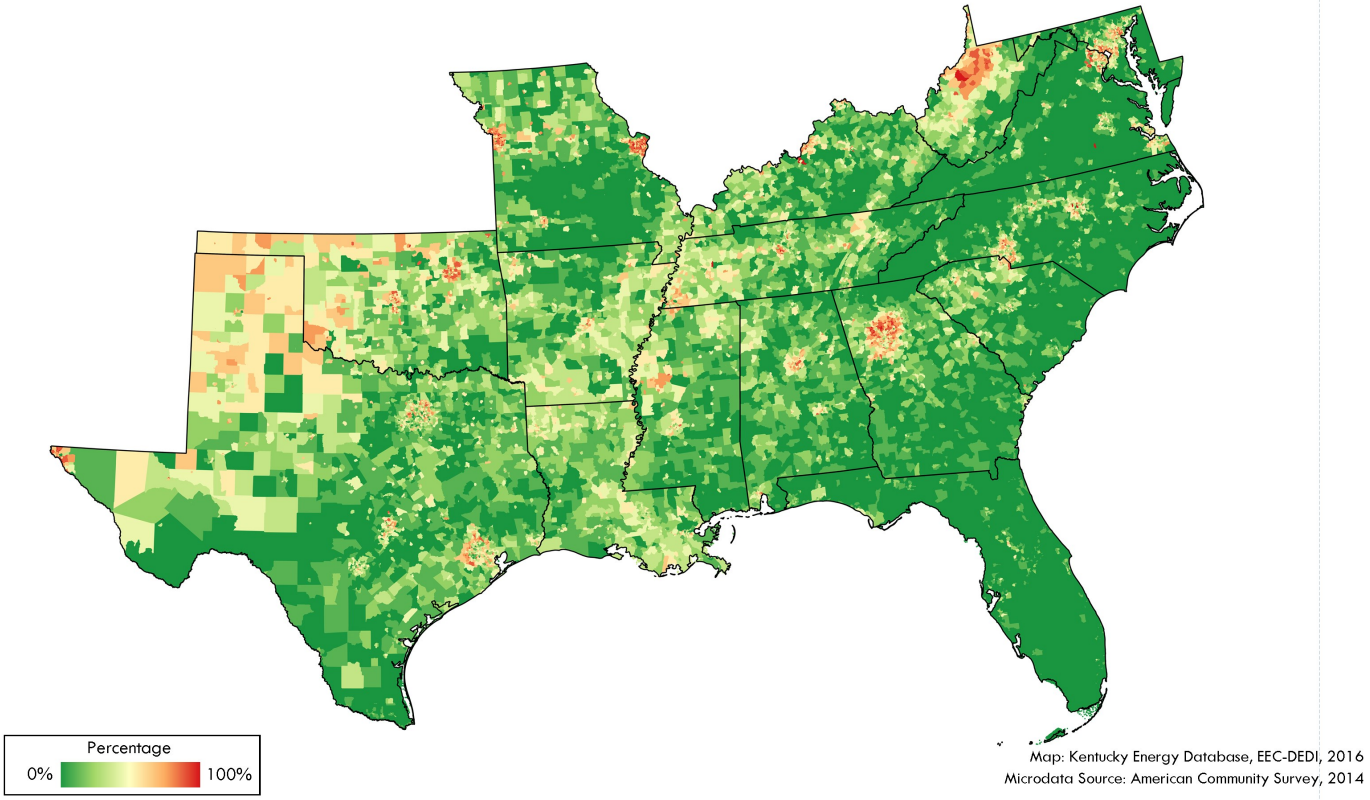
## Homes Heating with Propane in SSEB Region




Map: Kentucky Energy Database, EEC-DEDI, 2016
Microdata Source: American Community Survey, 2014

# Home Heating

## Homes Heating with Natural Gas in SSEB Region

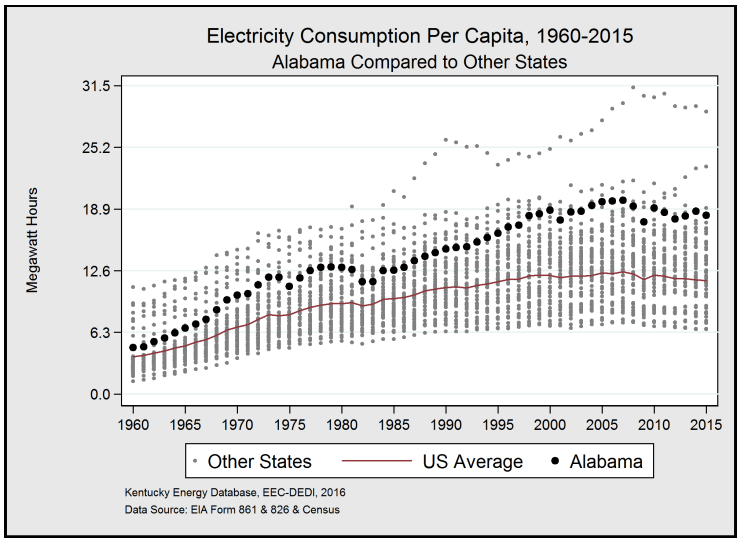


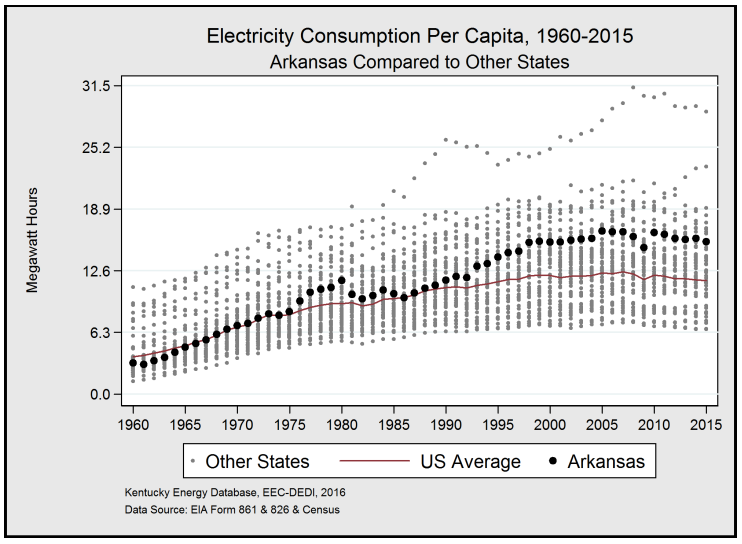

Homes in the southern Atlantic seaboard, Florida, and across the Gulf coast heat mostly with electricity; electric heating usage diminishes further north and west, with the exception of pockets in the Appalachian Mountains region. Electric heating further north can present a financial hardship, especially to lower income households.

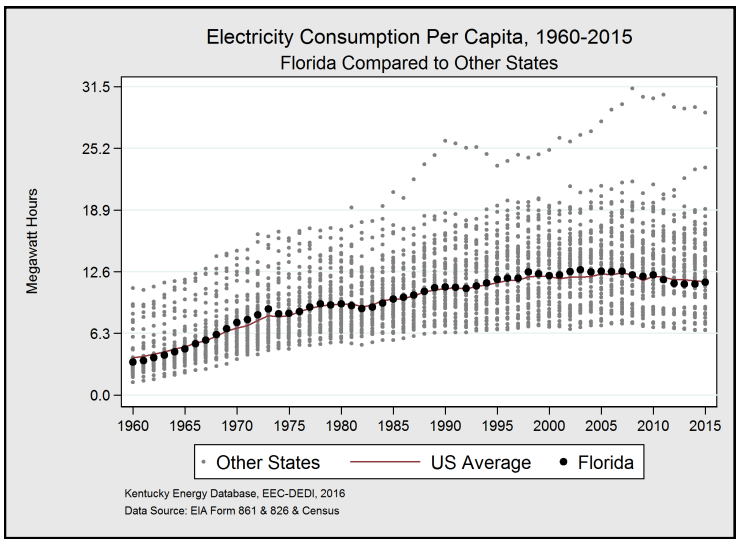
Propane is commonly used in rural areas, owing to its transport and storage characteristics. Overall, however, a proportional usage is lower along the Gulf Coast and the Appalachian coal fields; highest in Missouri, northern Arkansas, and throughout the cotton belt, running from Mississippi up to coastal North Carolina.

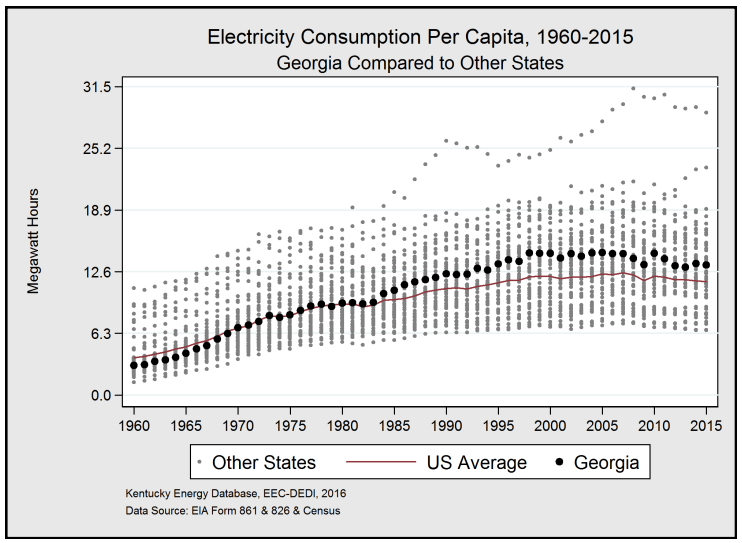
Because of distribution infrastructure limitations, natural gas heating is typically limited to more urban areas, with the exception of northern West Virginia, Oklahoma panhandle and northern Texas.

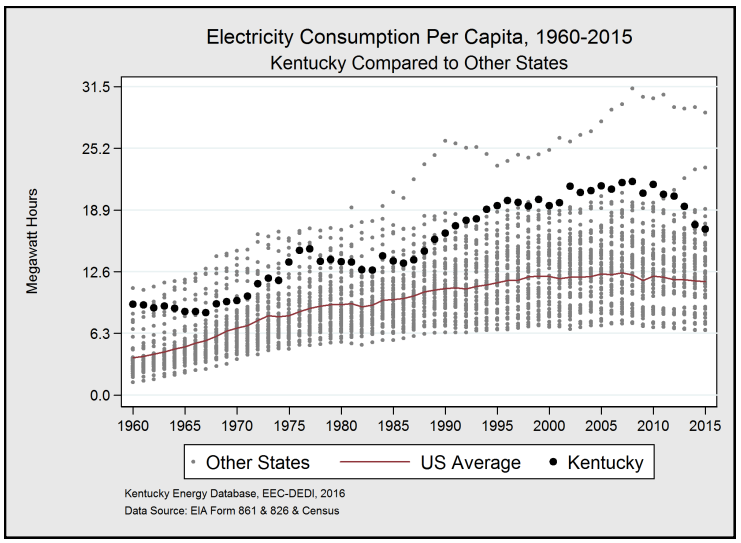
# Historical Electricity Use per Capita

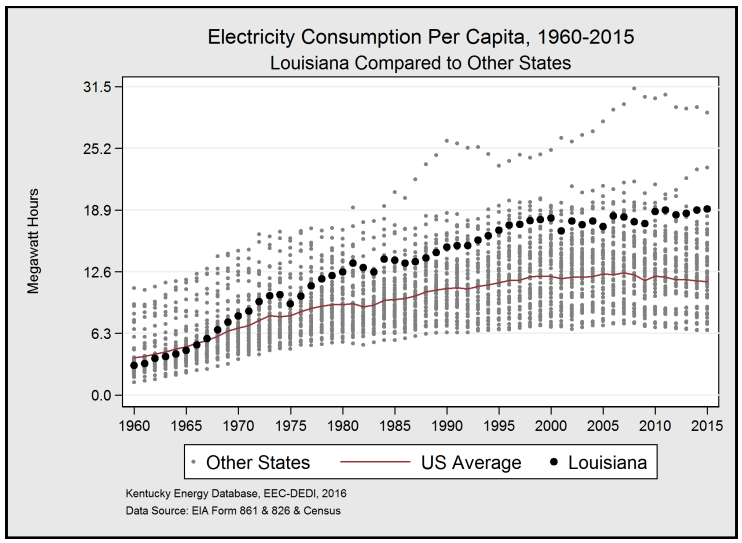


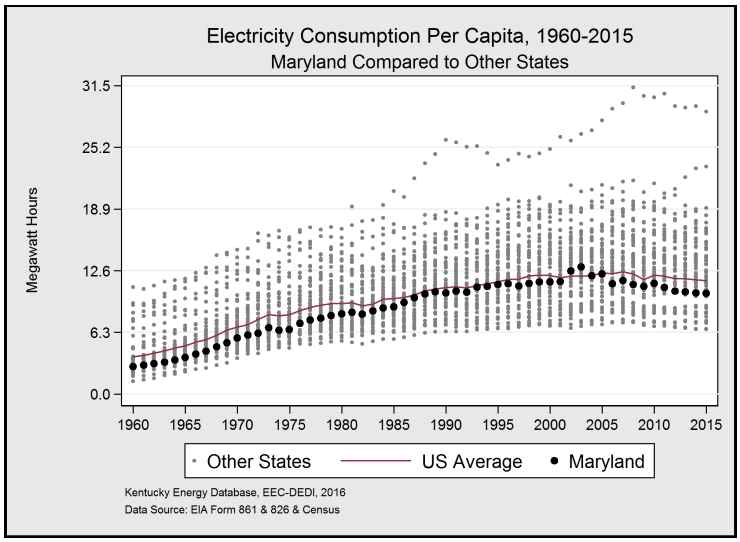



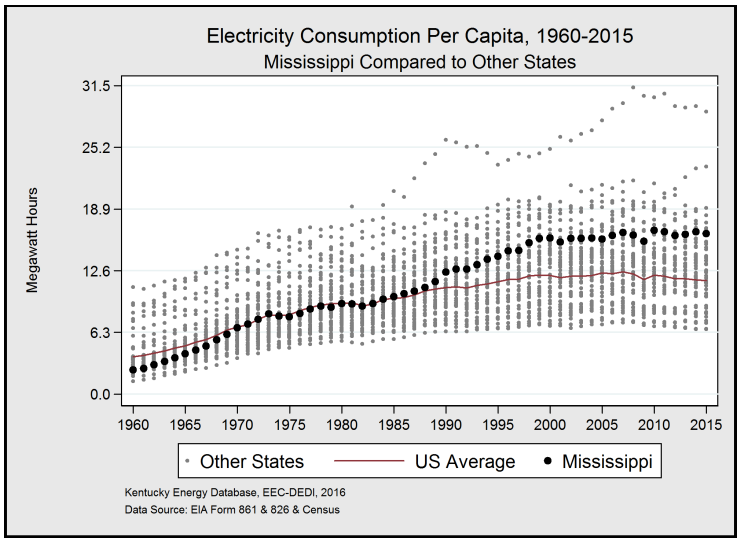



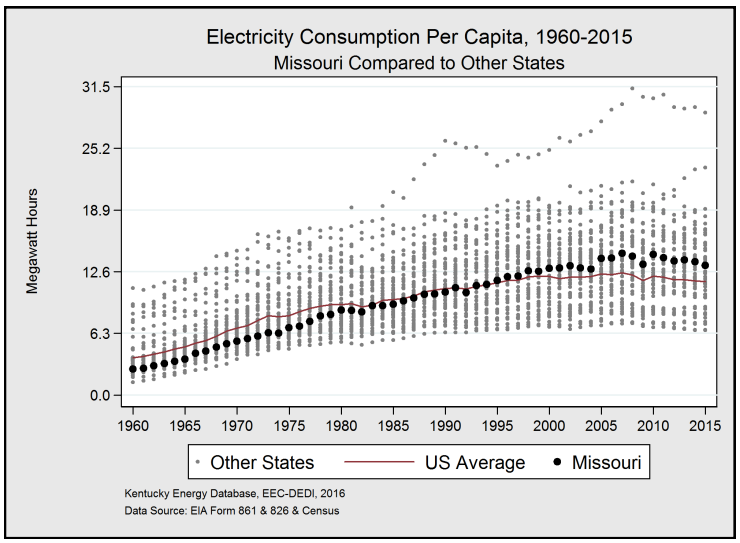



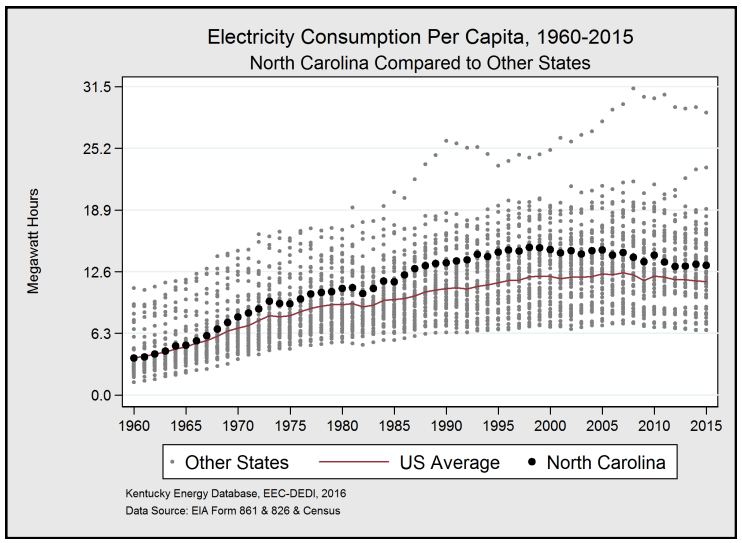



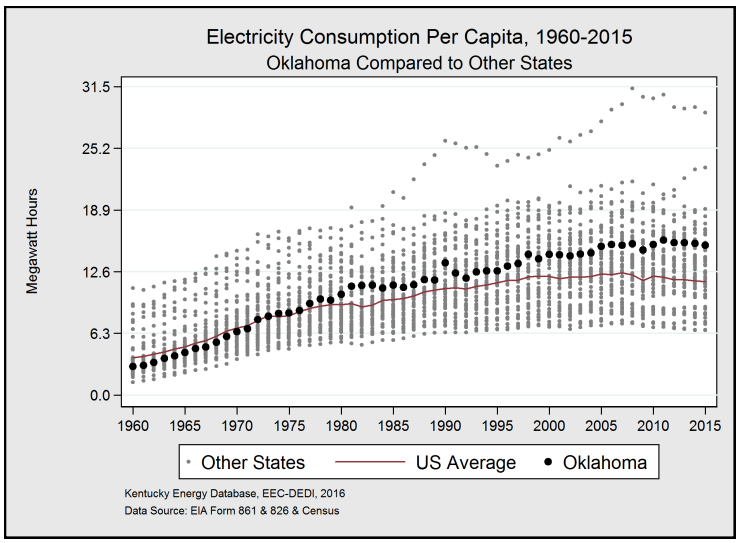
# Historical Electricity Use per Capita

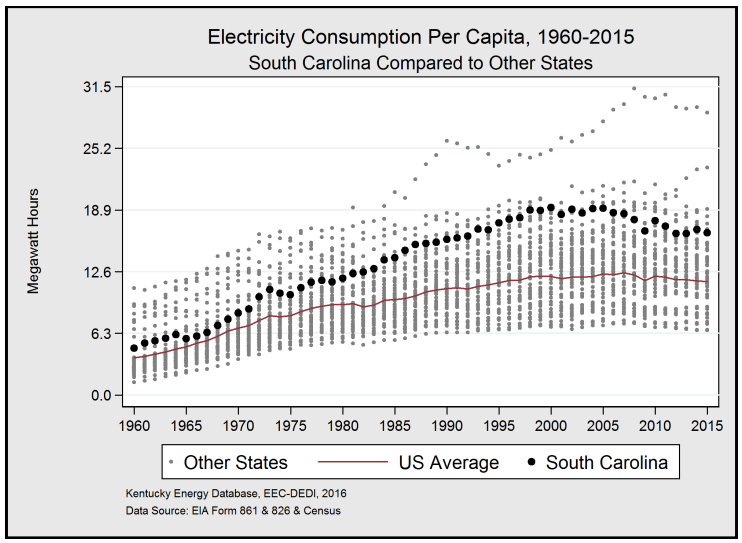


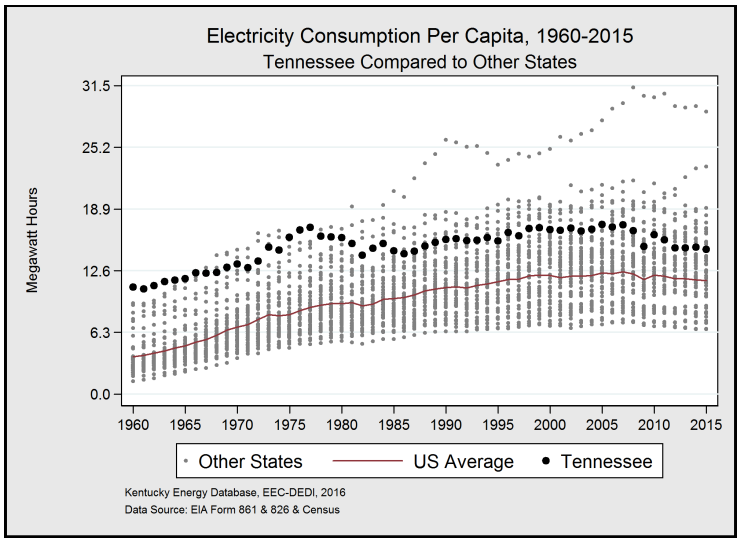



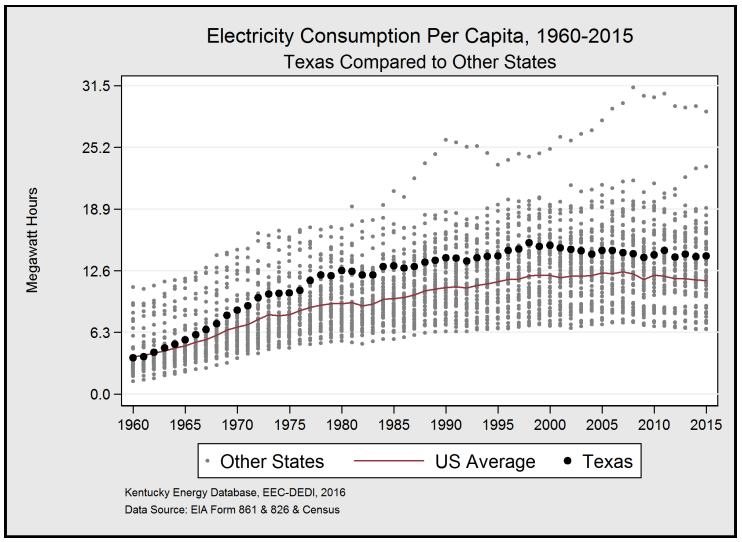



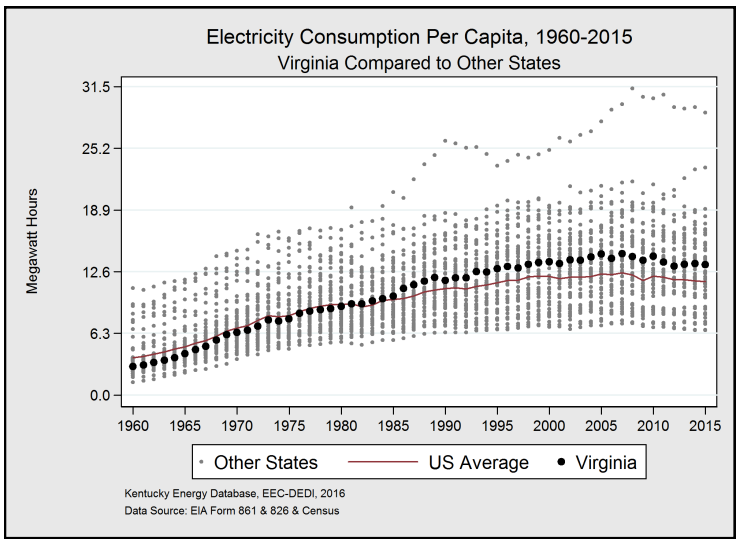



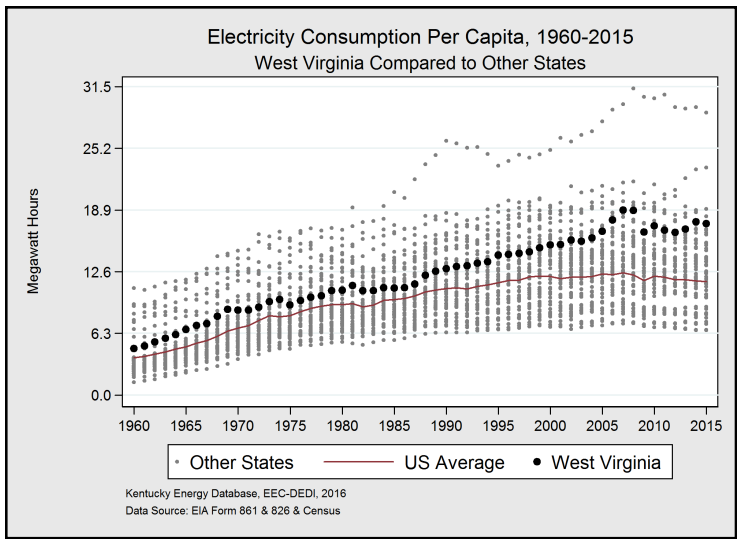



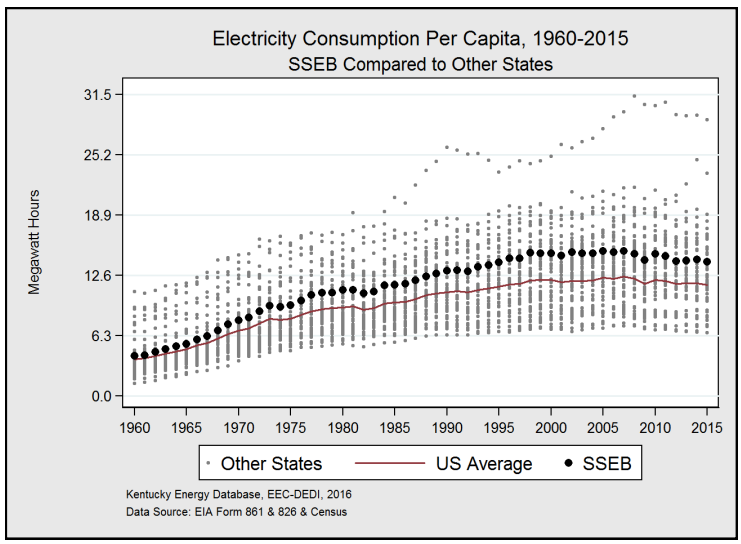
# Historical Electricity Use per Capita



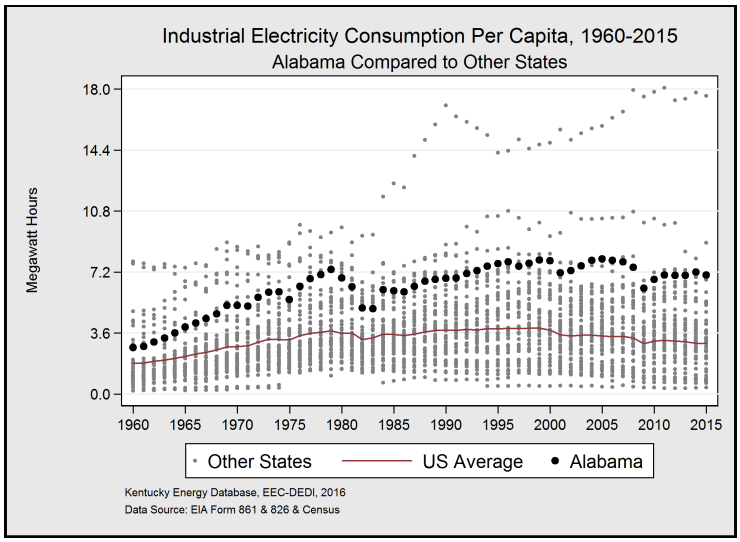



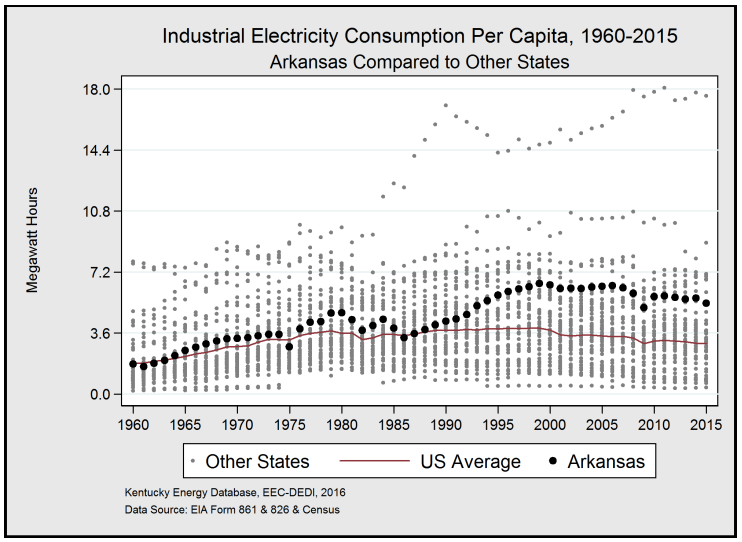



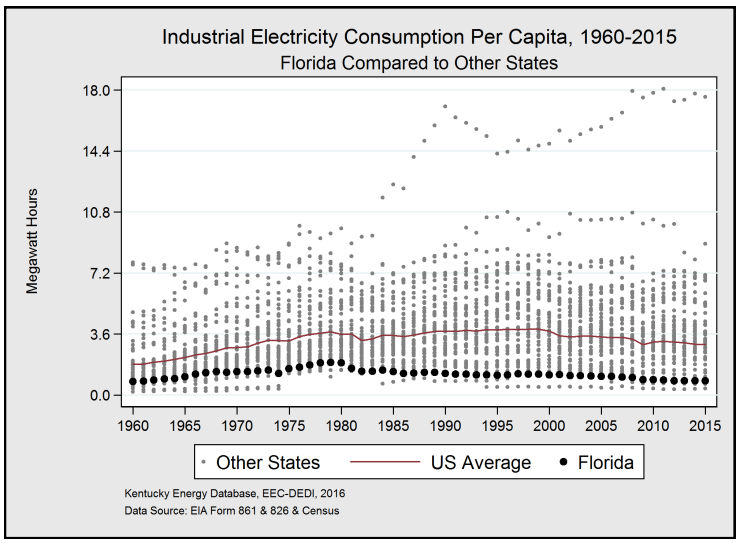



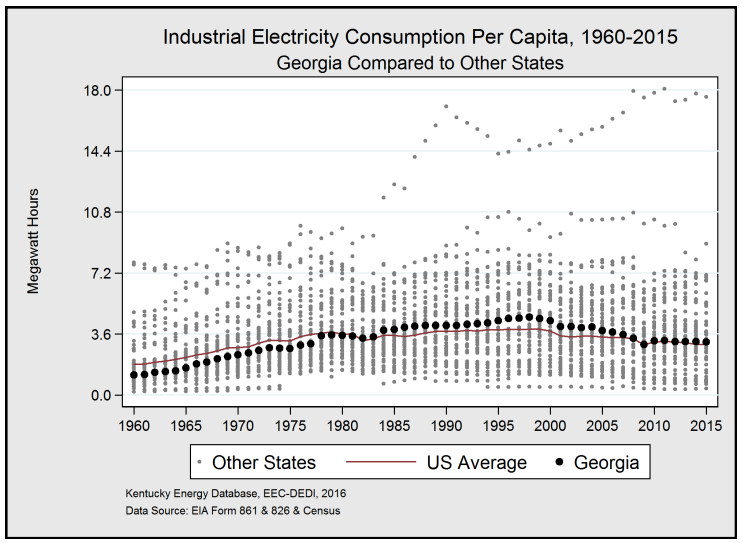



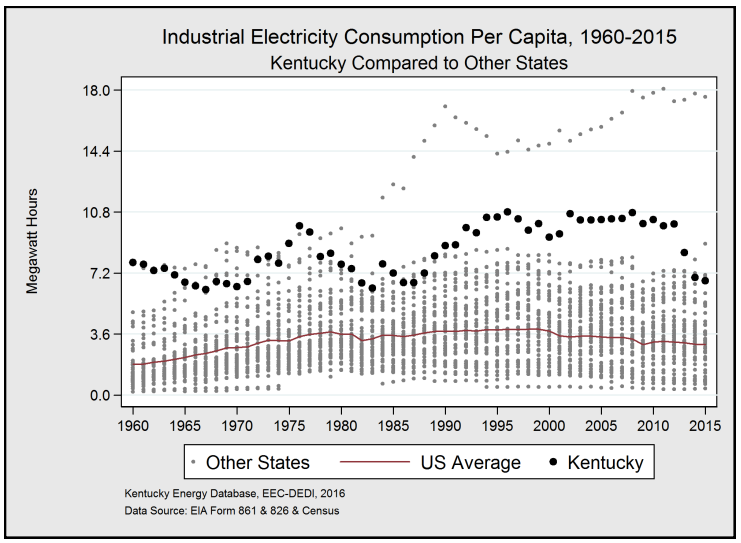
# Historical Industrial Electricity Use per Capita

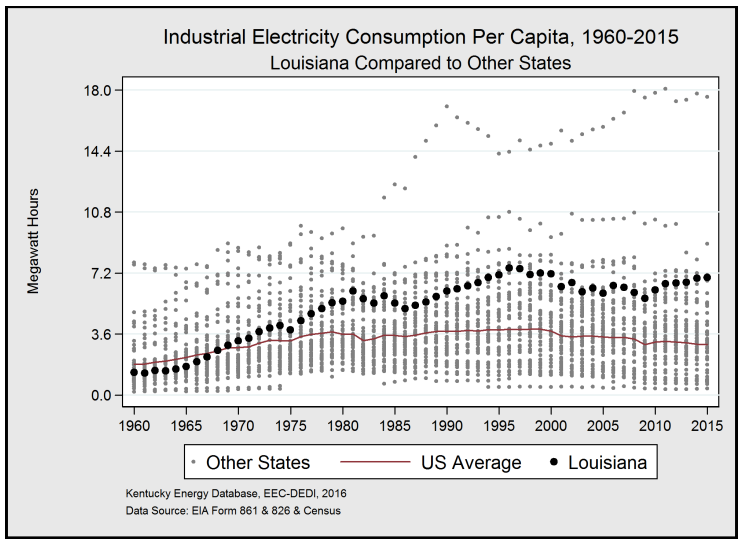


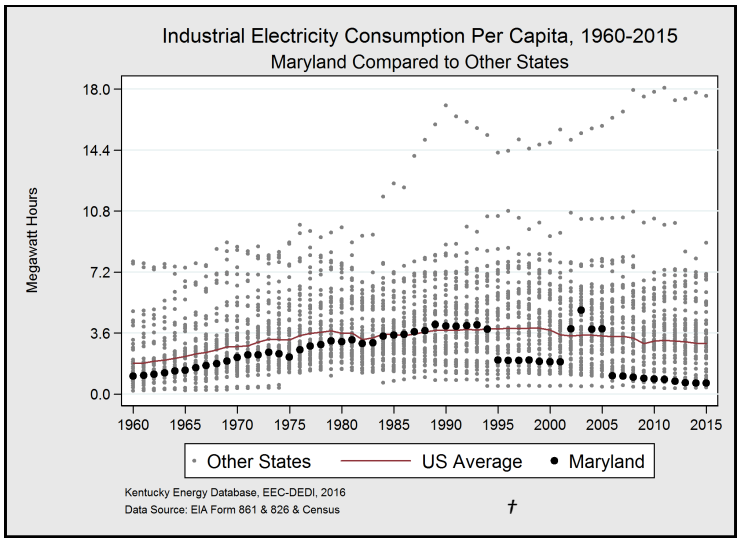



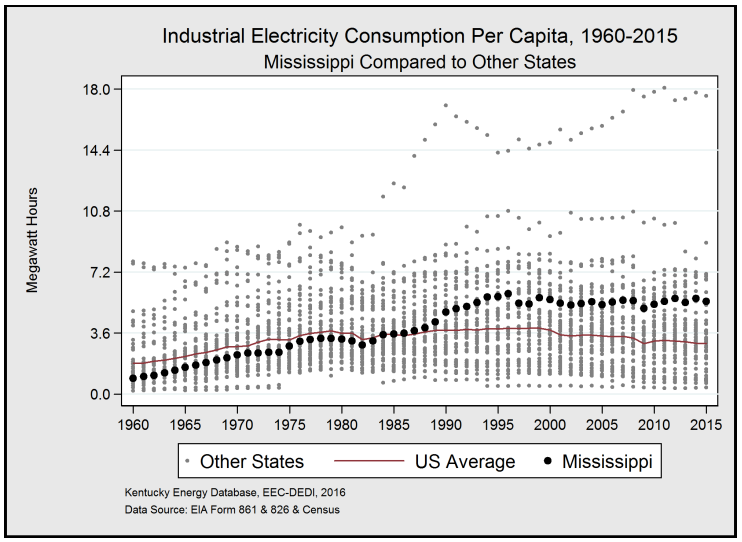



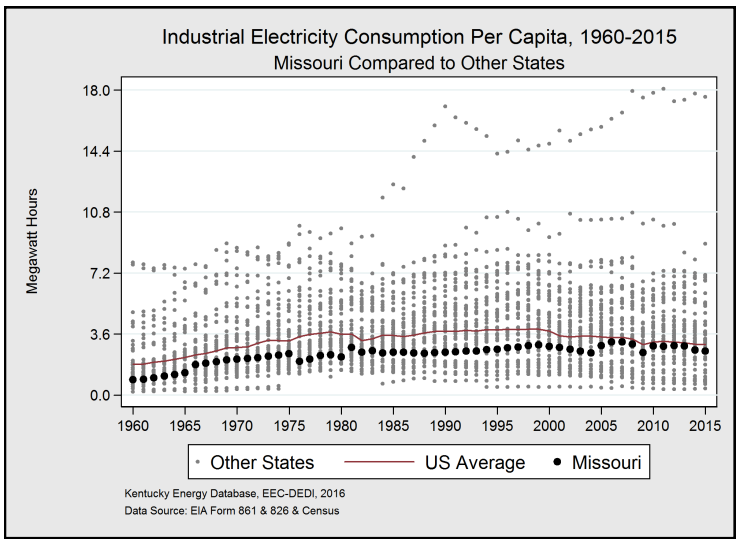



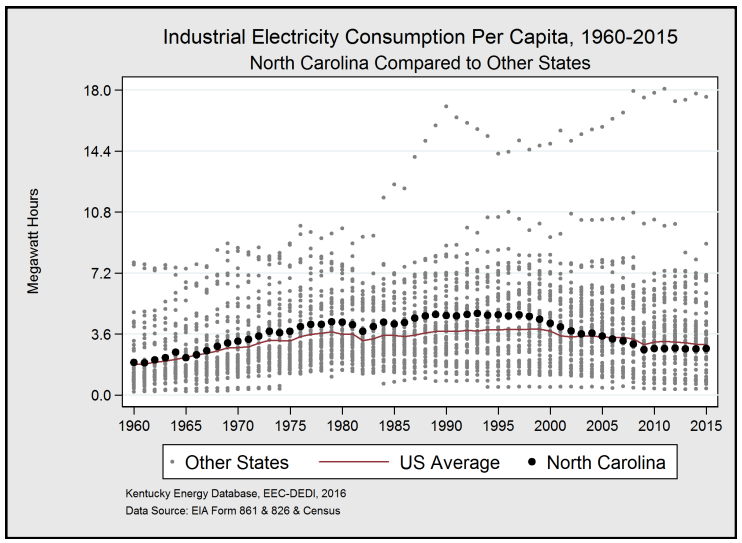



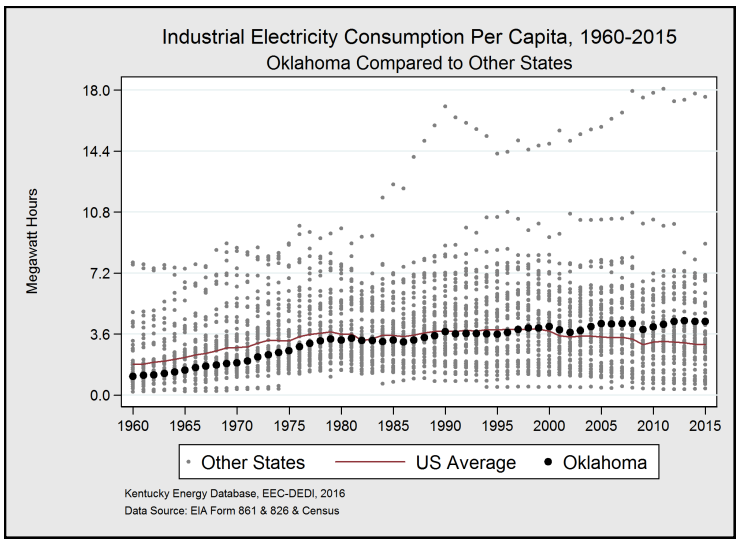
# Historical Industrial Electricity Use per Capita

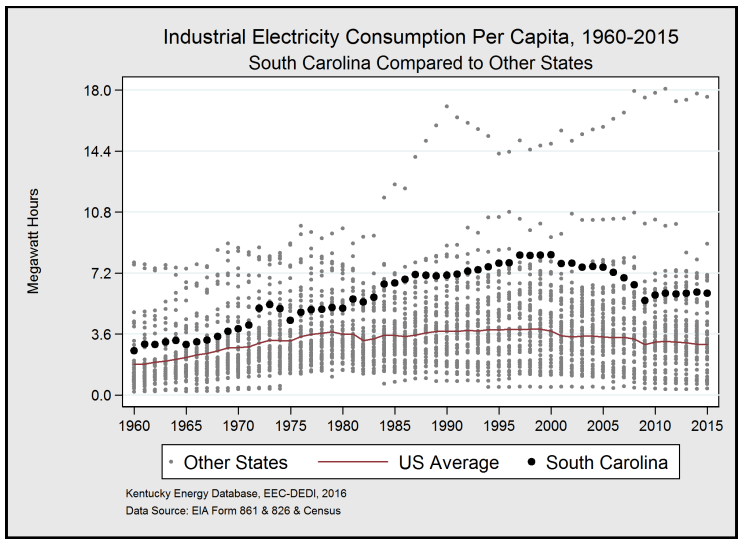


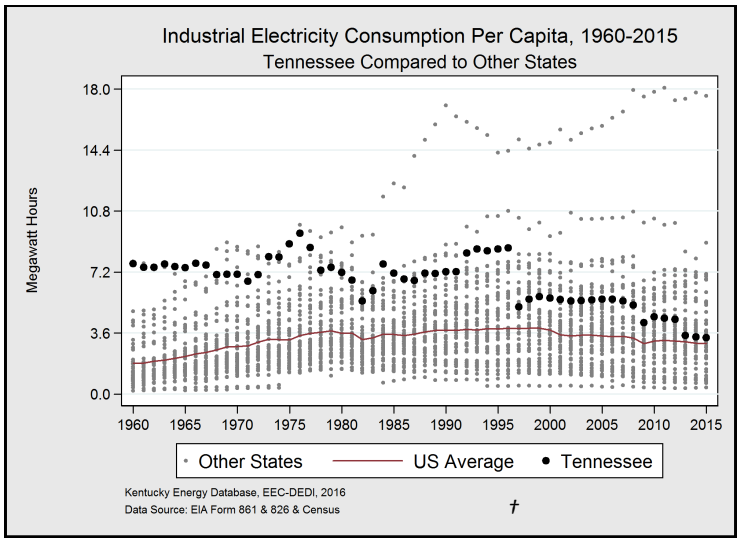



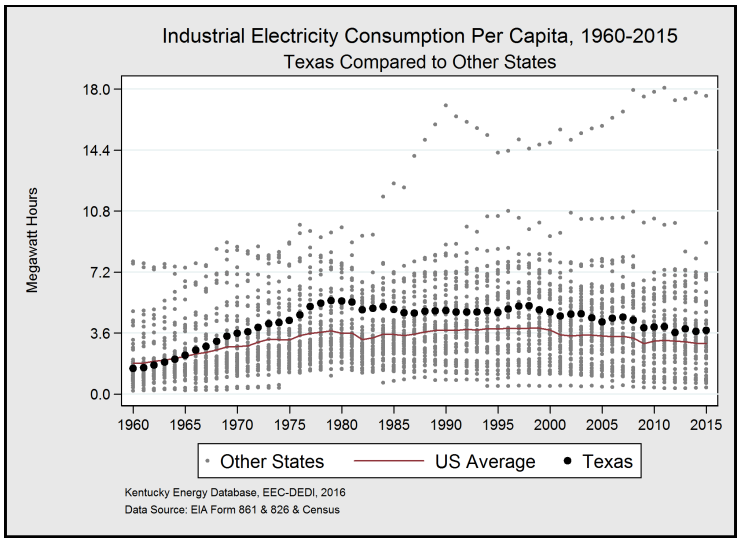



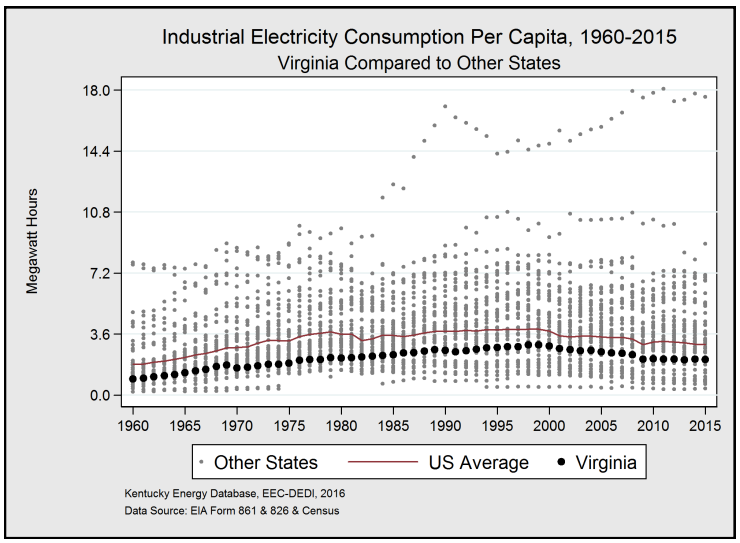



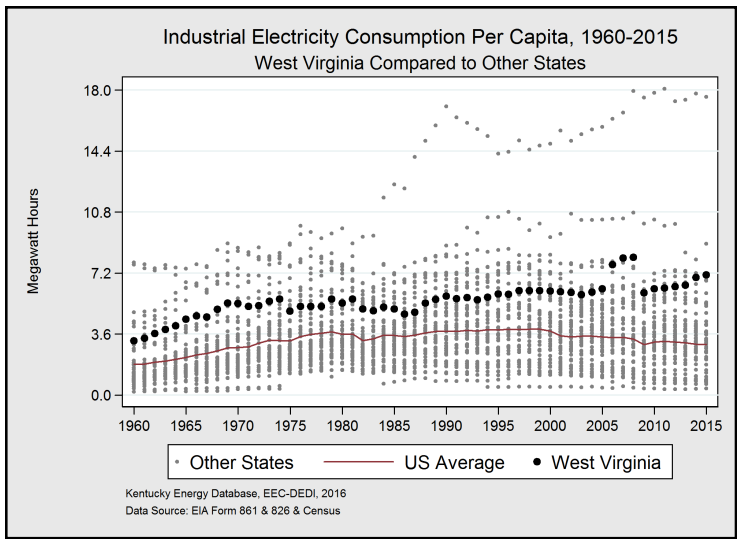



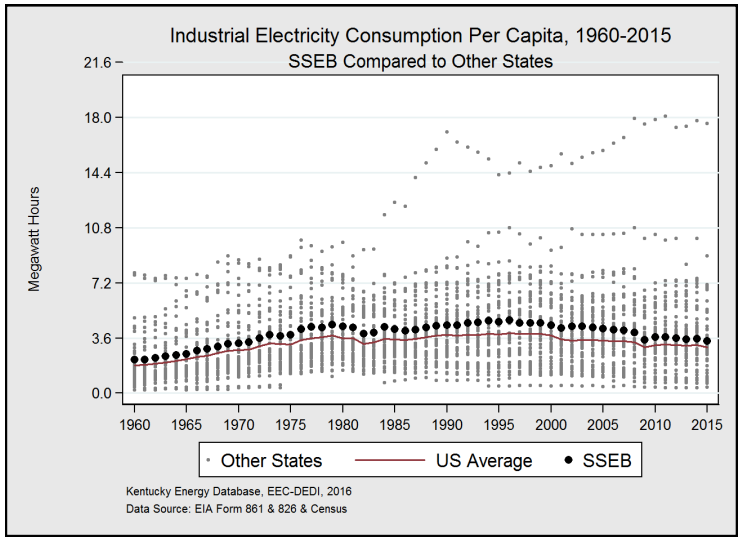
# Historical Industrial Electricity Use per Capita



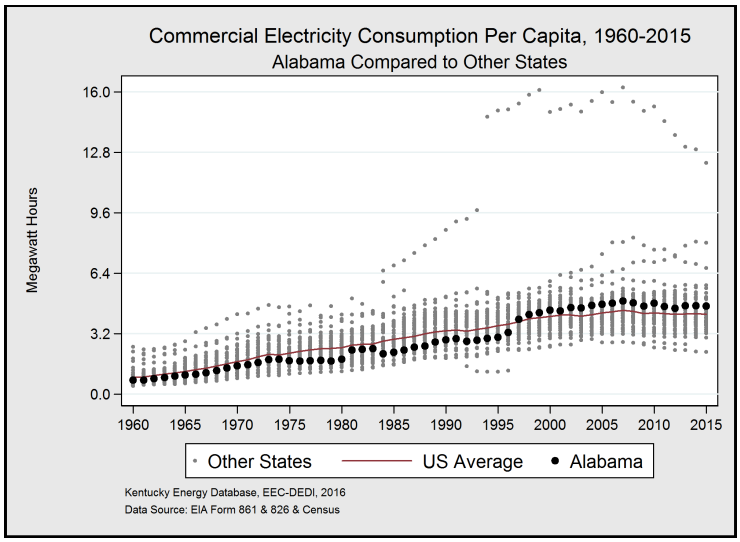



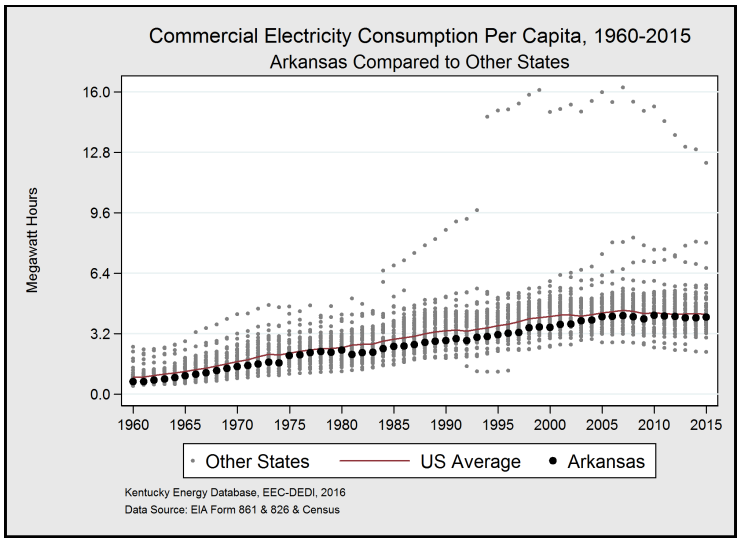



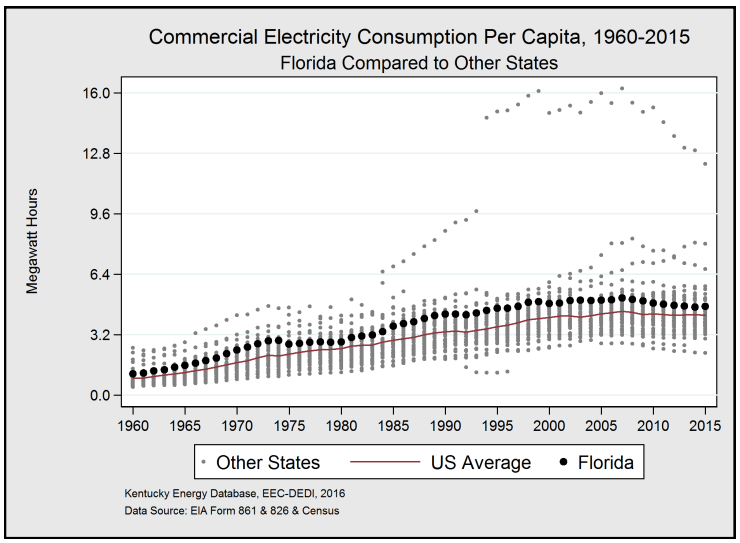



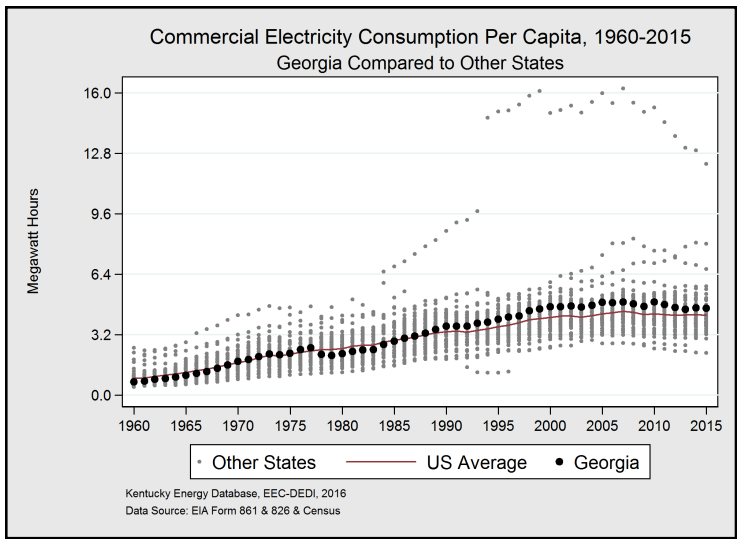

*† Maryland and Tennessee show substantial fluctuation in per capita industrial electricity consumption due to the reclassification of certain industrial processes as commercial during this timeseries.*

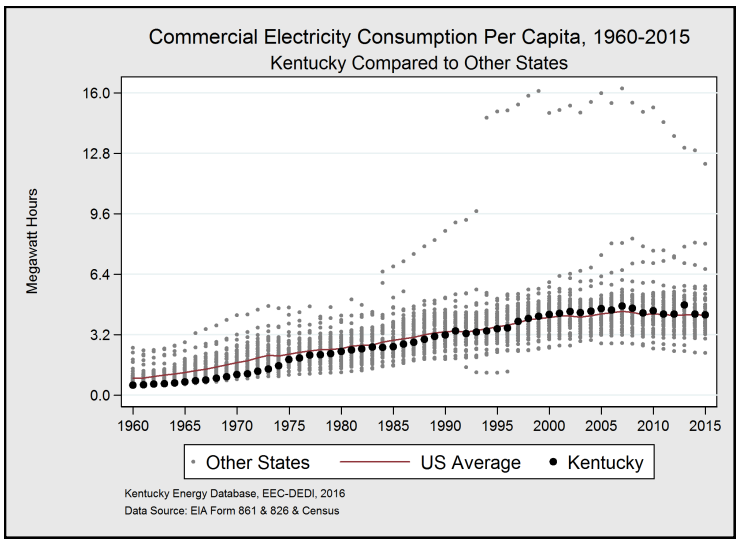
# Historical Commercial Electricity Use per Capita

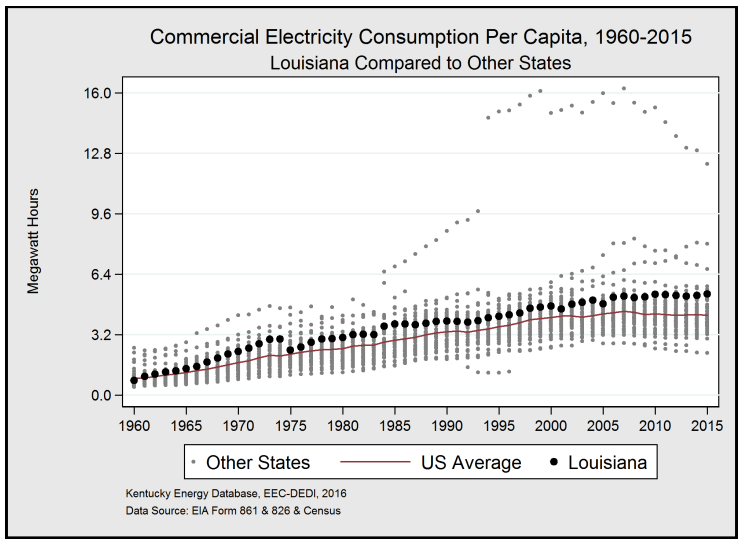


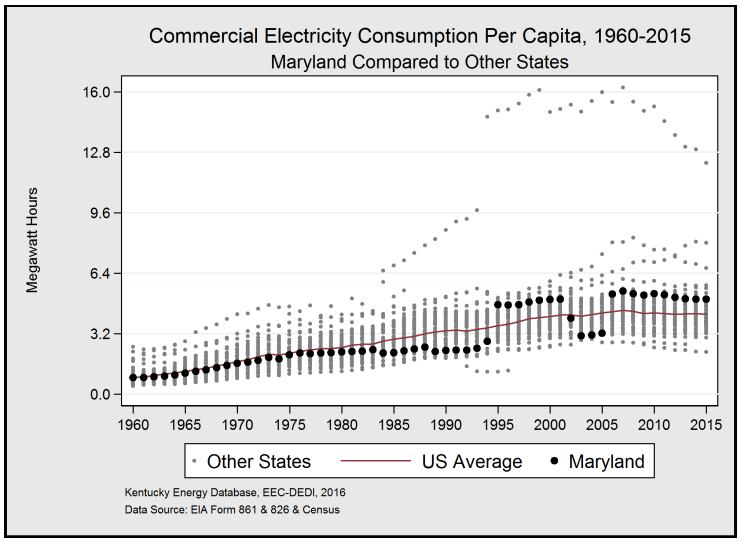



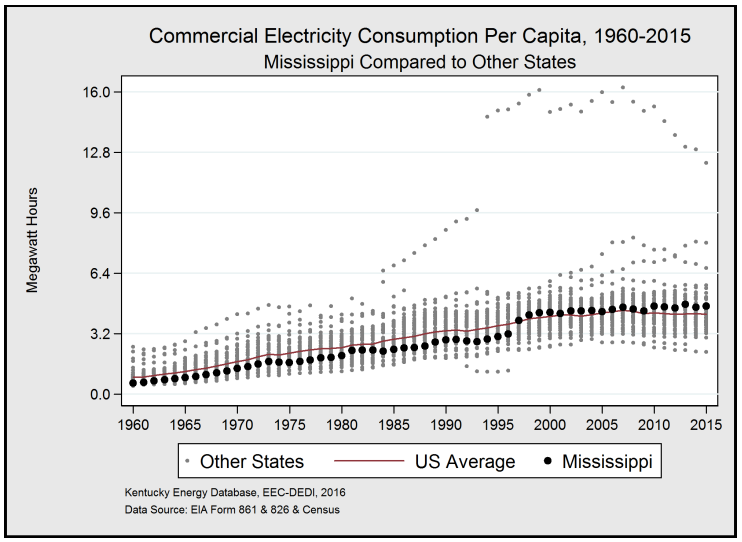



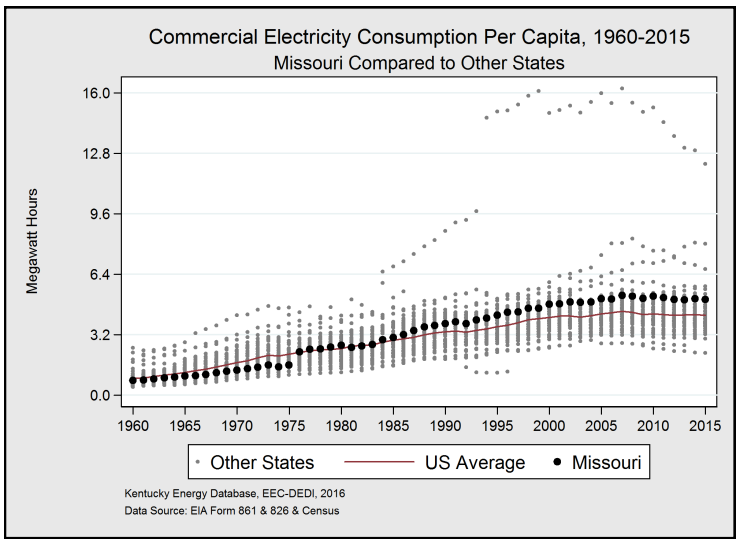



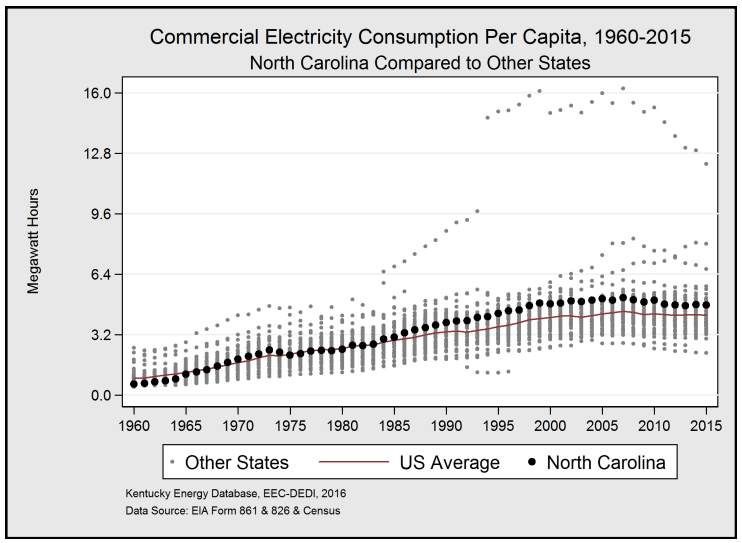



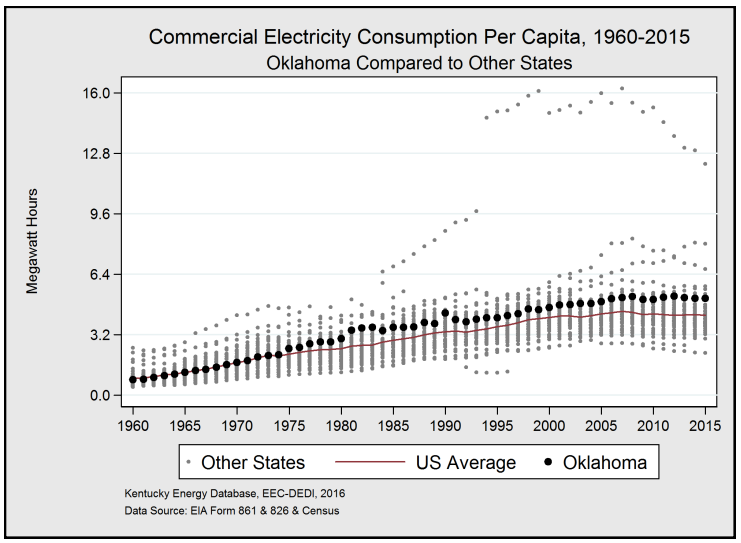
# Historical Commercial Electricity Use per Capita

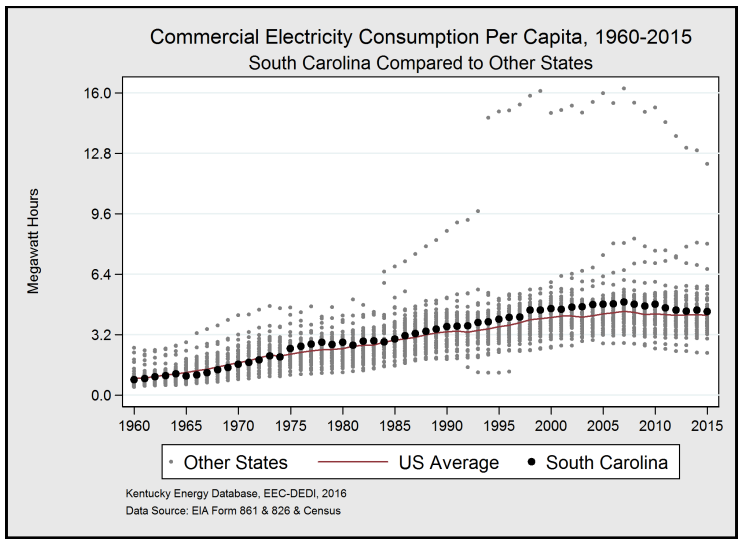


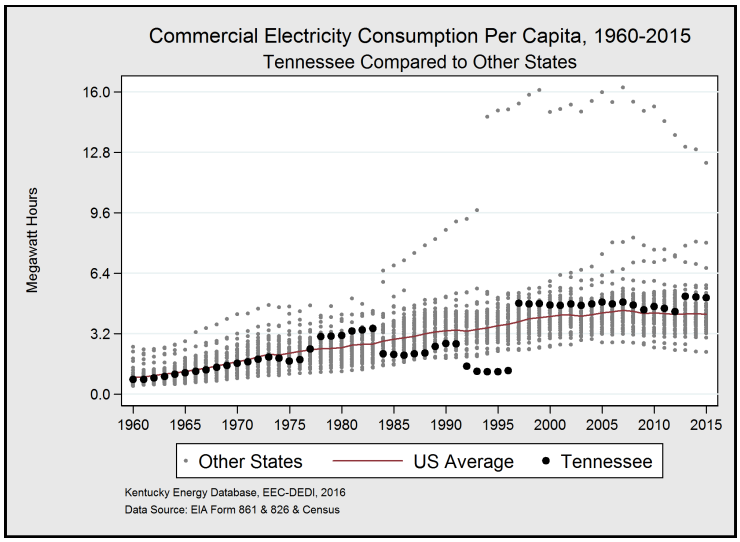



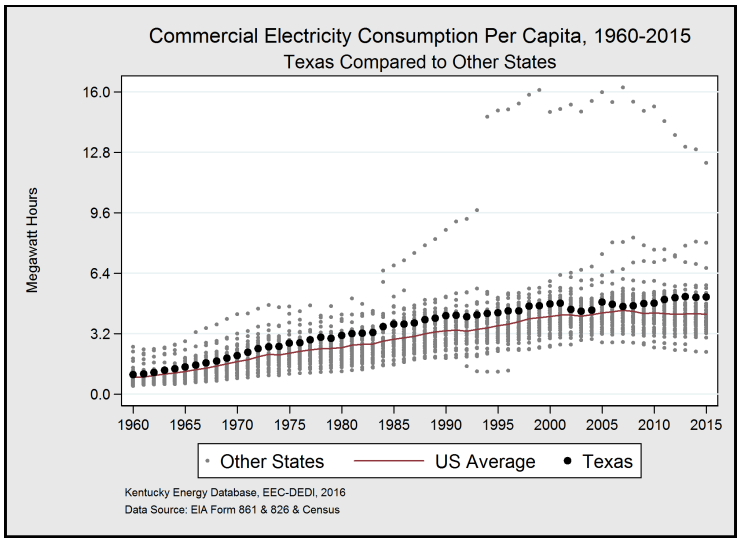



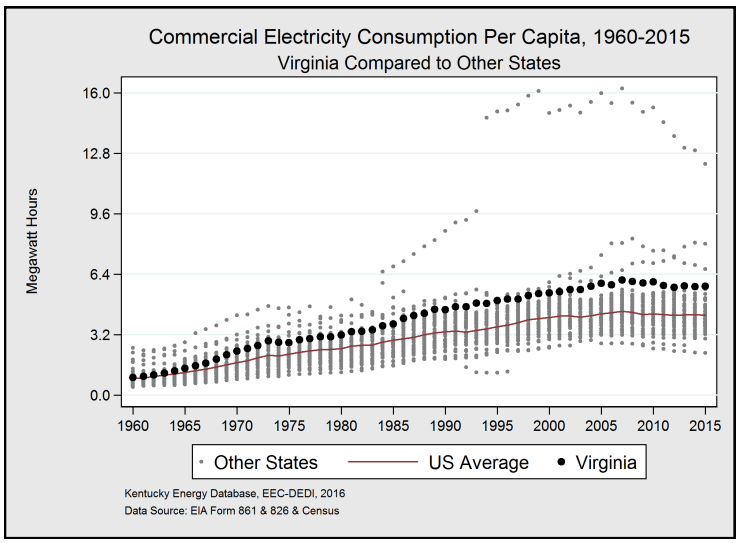



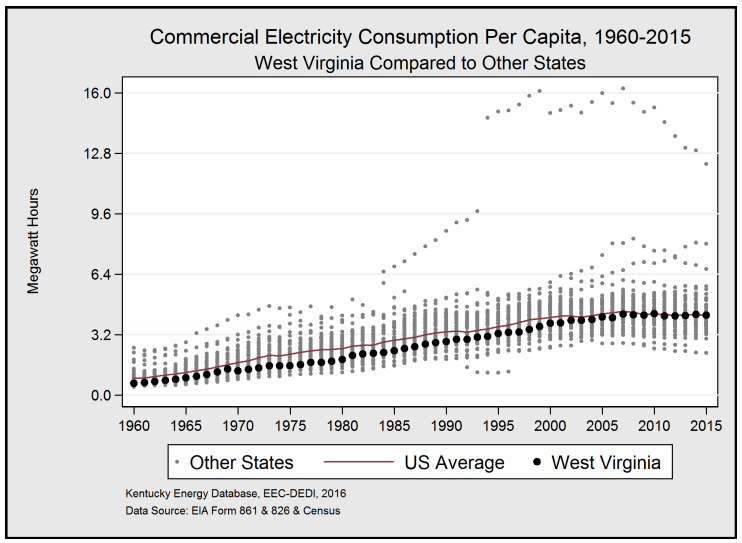



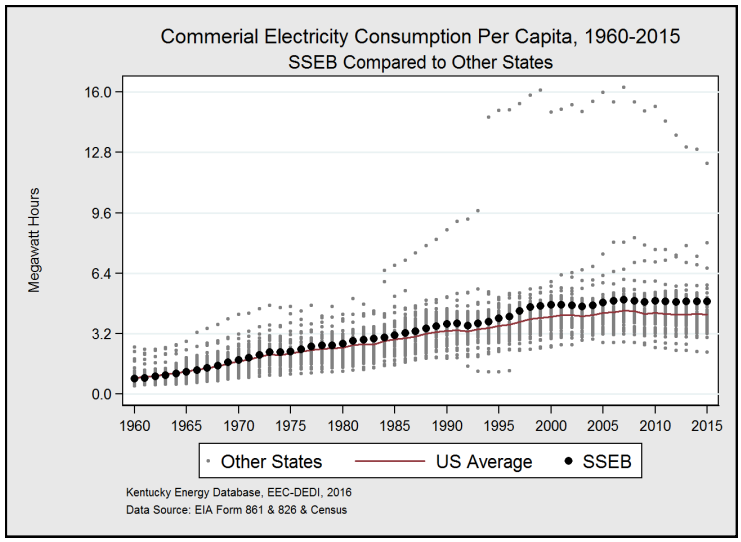
# Historical Commercial Electricity Use per Capita



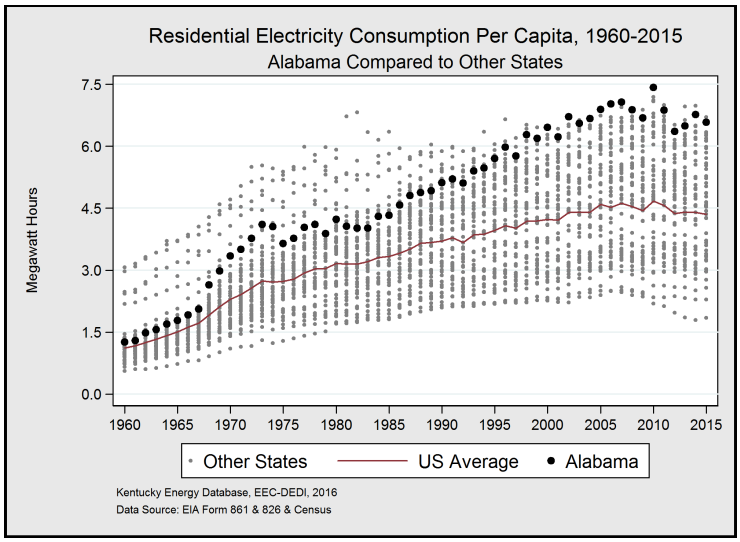



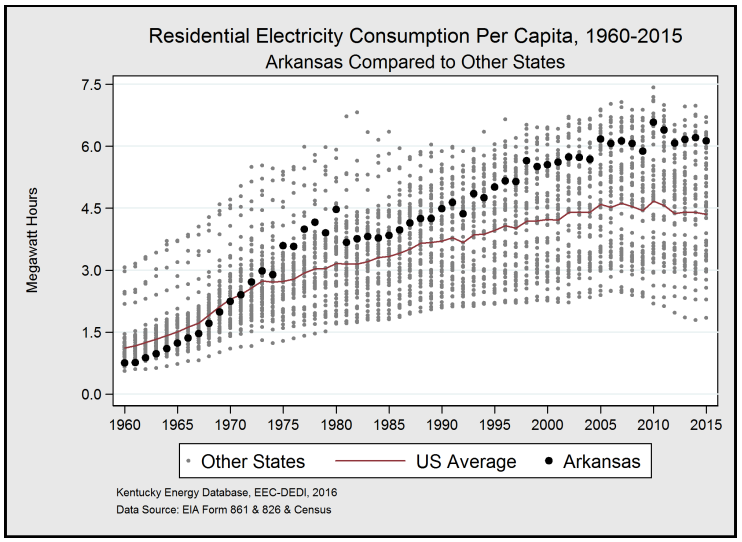



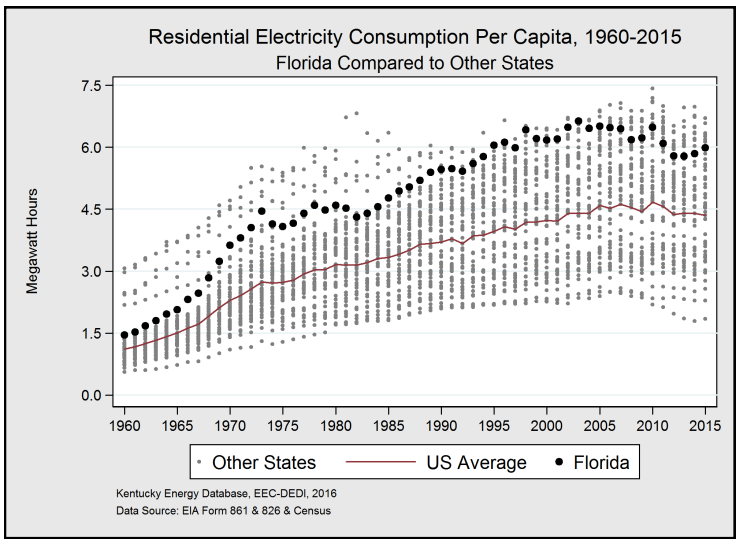



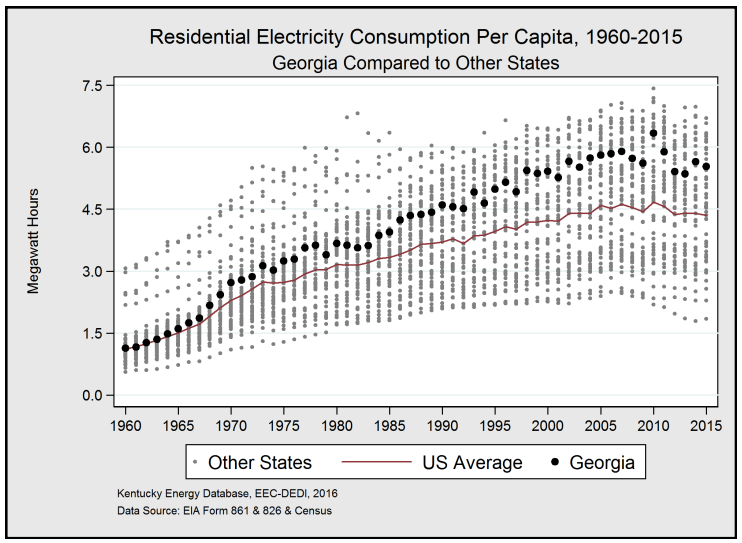

*Maryland and Tennessee show substantial fluctuation in per capita commercial electricity consumption due to the reclassification of certain industrial processes as commercial during this timeseries.*

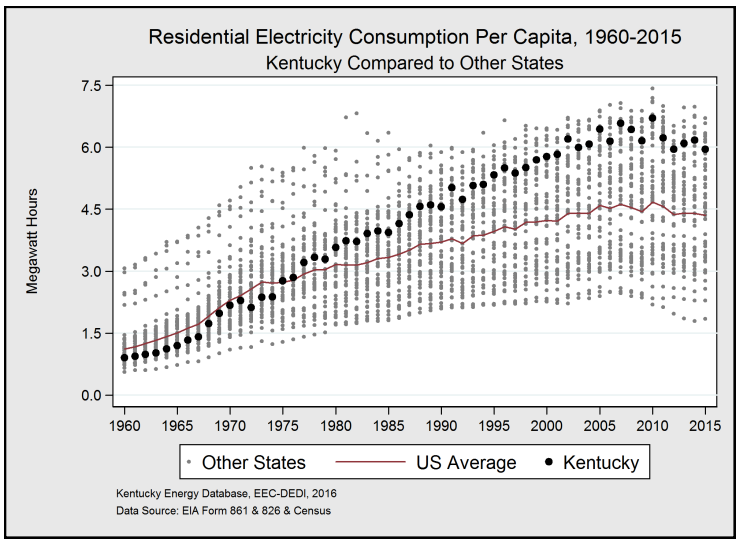
# Historical Residential Electricity Use per Capita

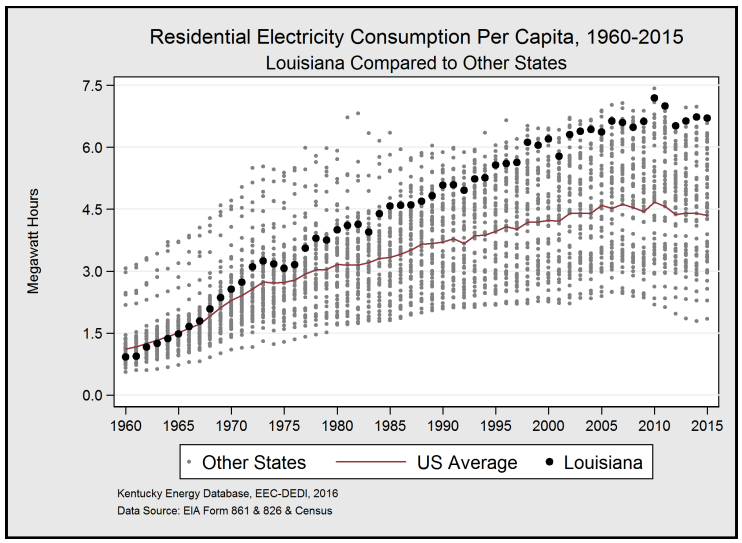


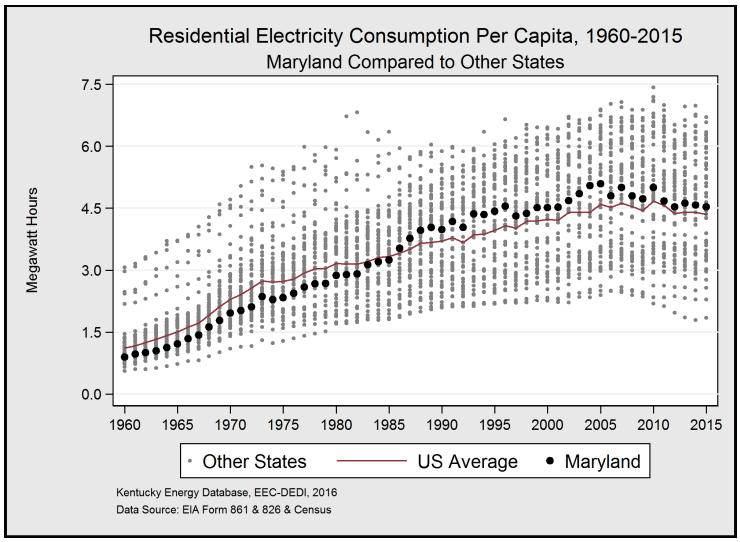



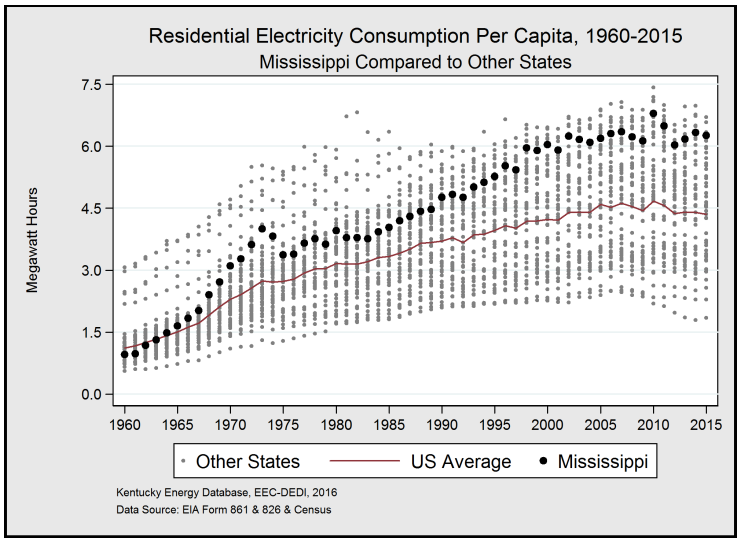



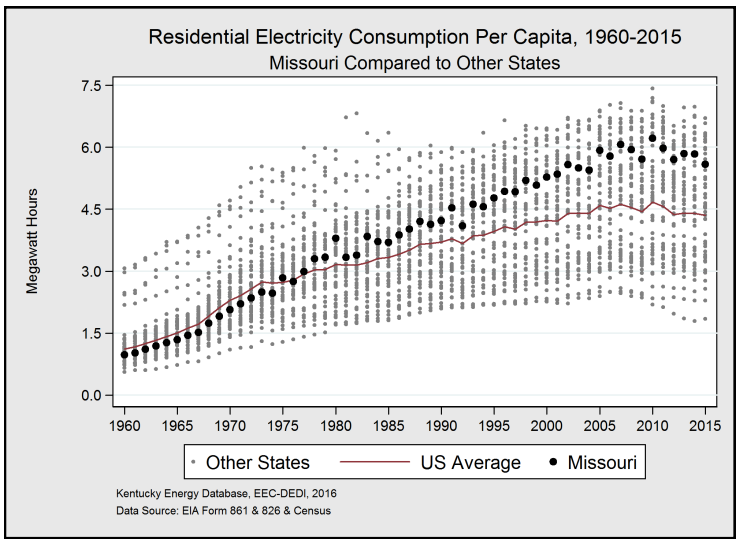



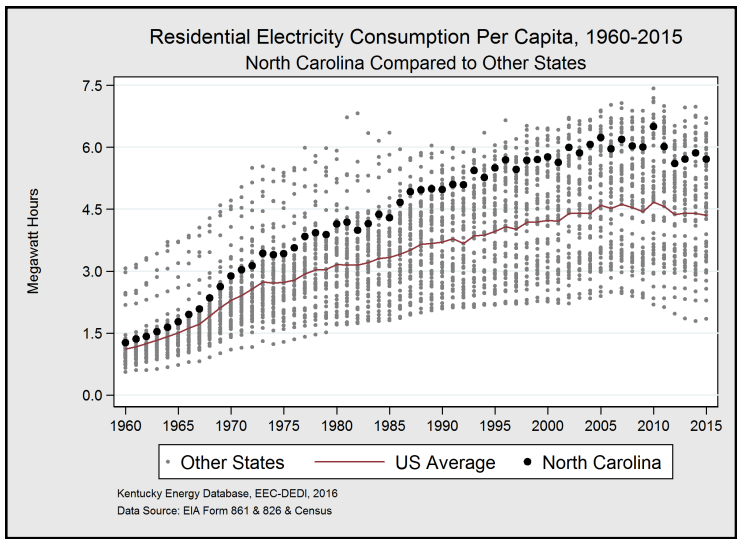



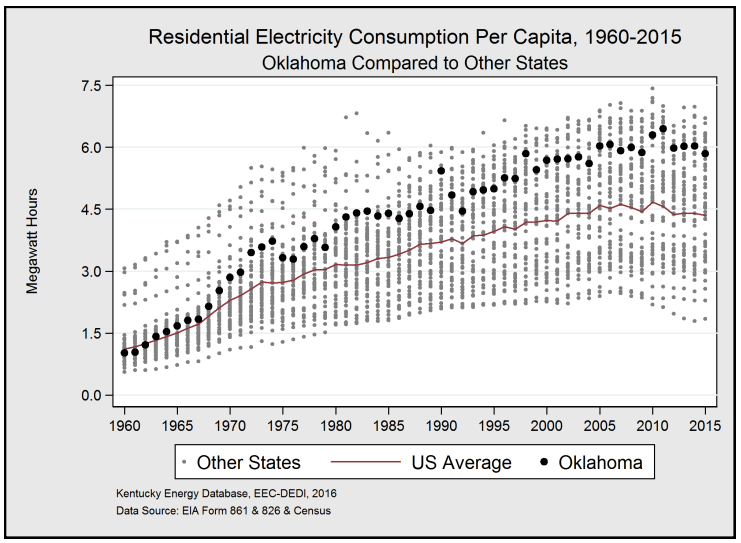
# Historical Residential Electricity Use per Capita

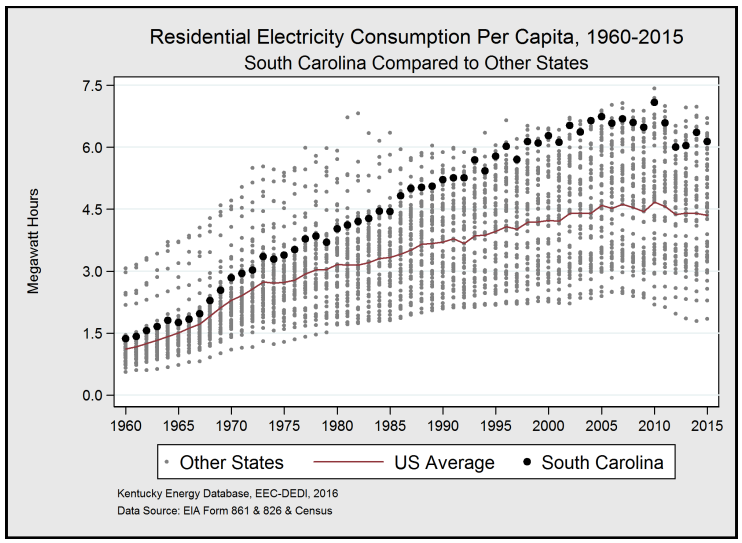


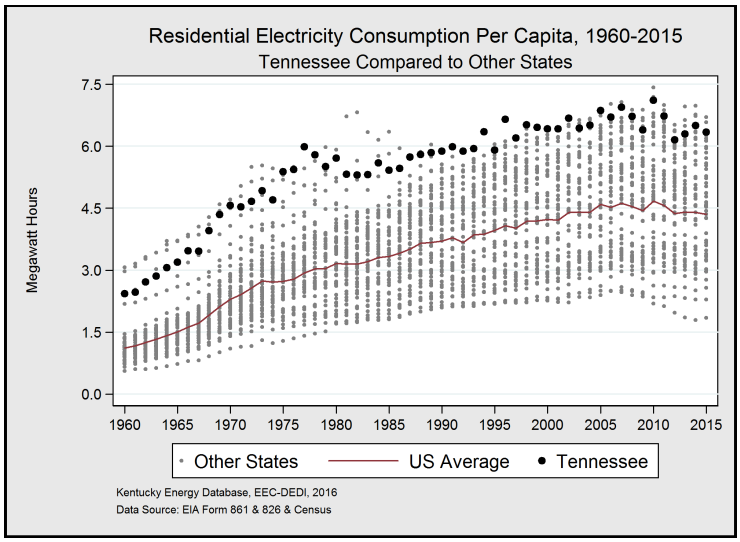



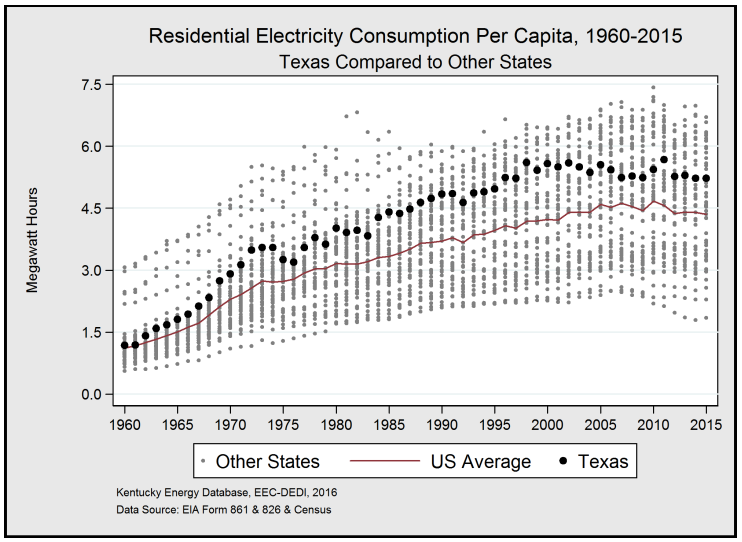



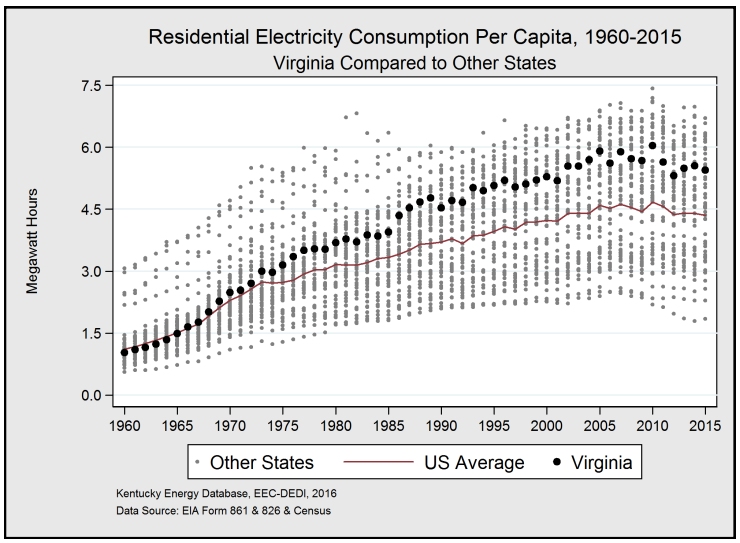



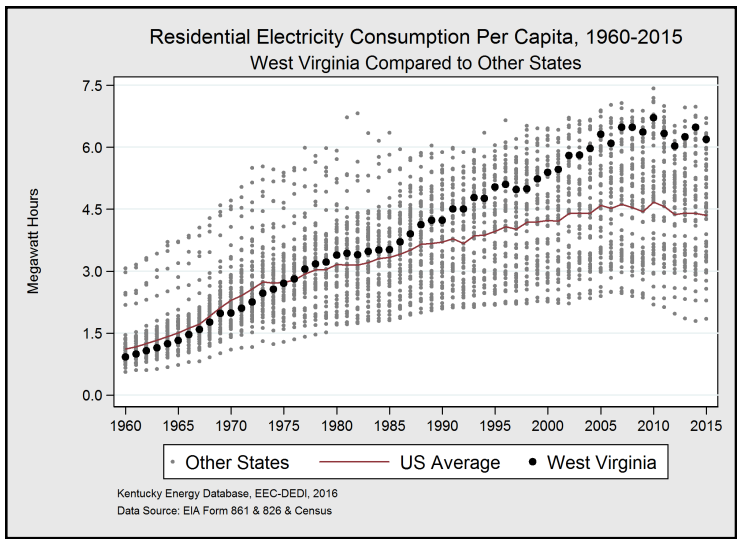



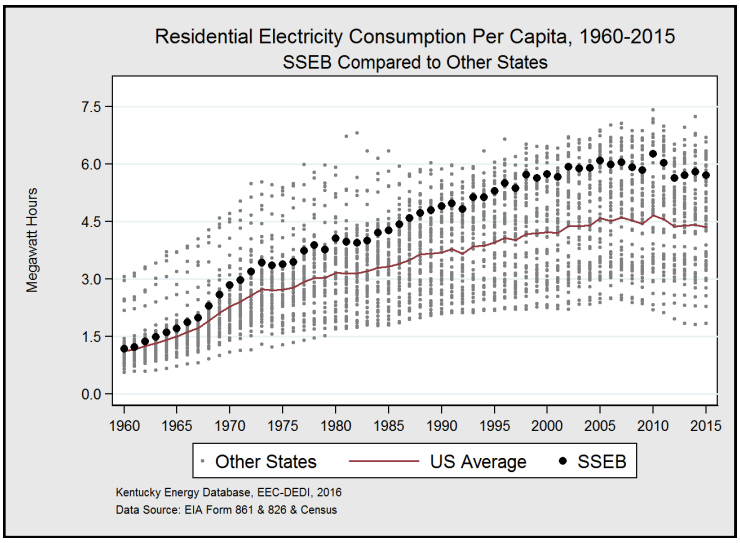
# Historical Residential Electricity Use per Capita



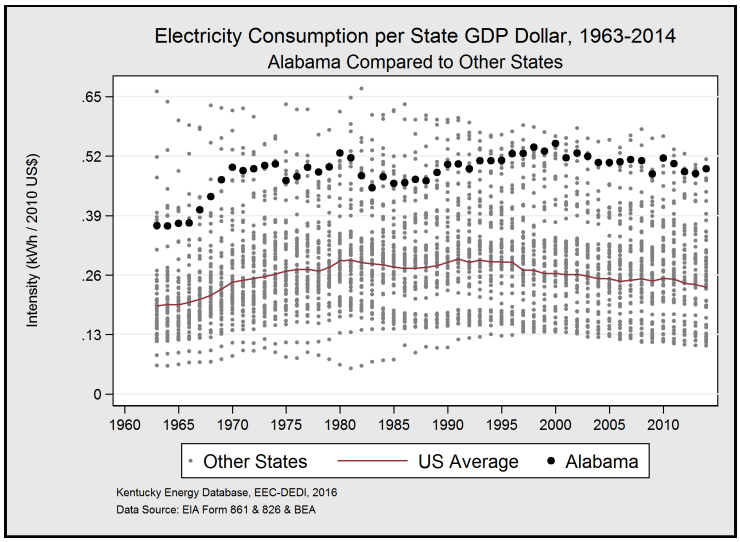



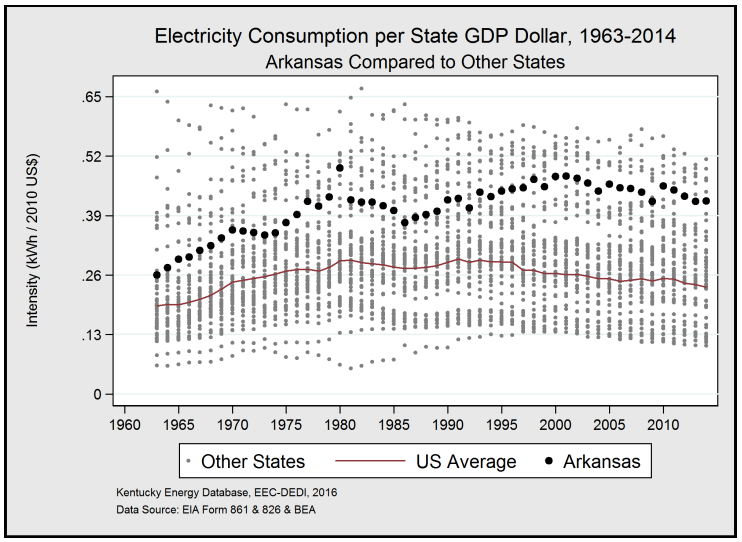



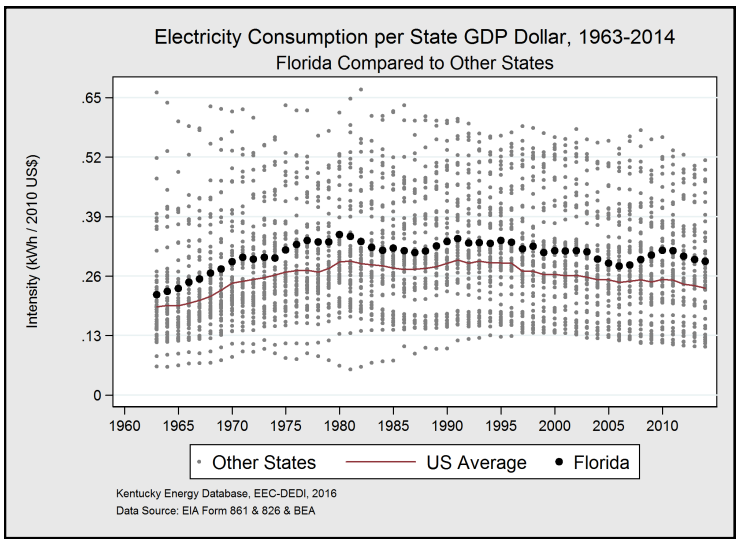



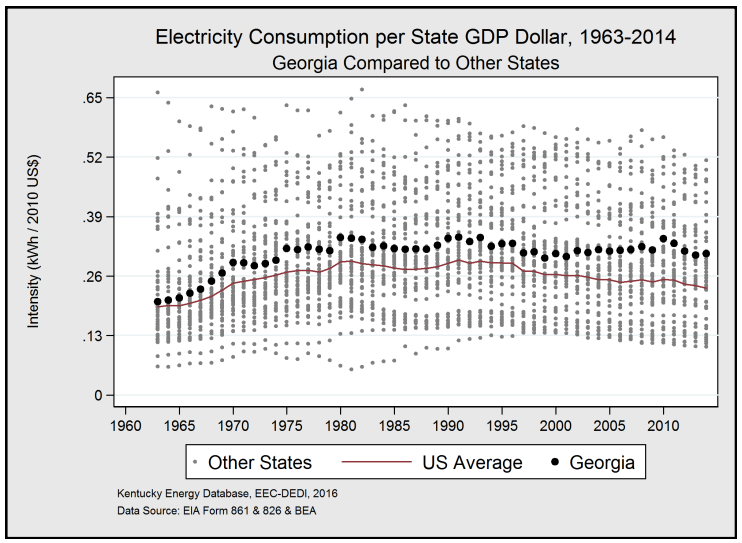



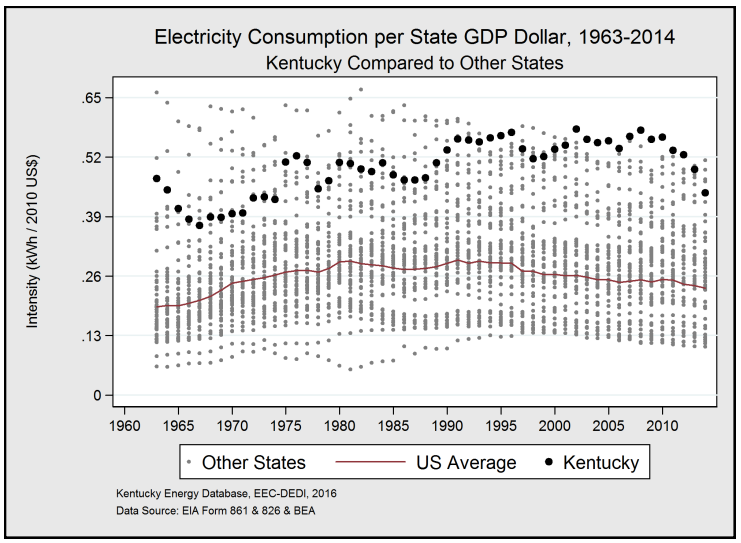
# Historical Electricity Intensity per GDP Dollar

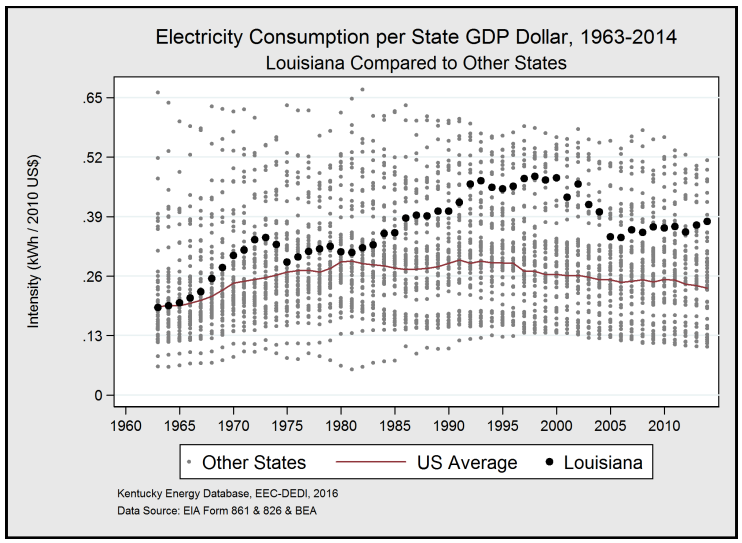


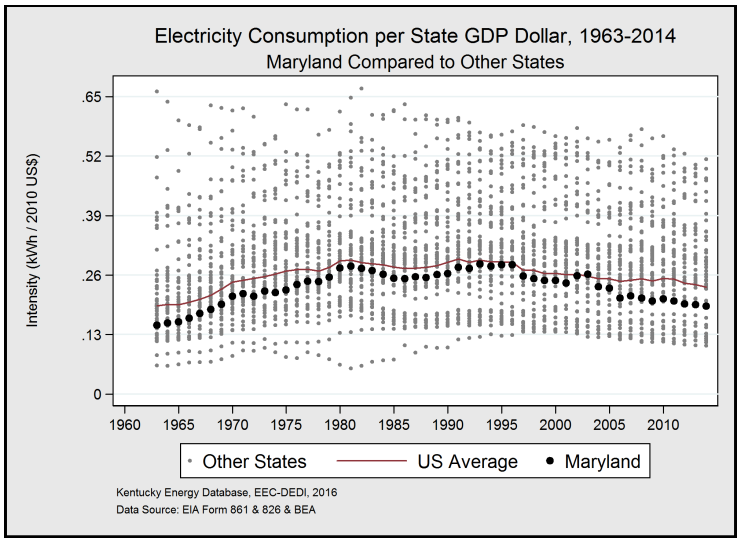



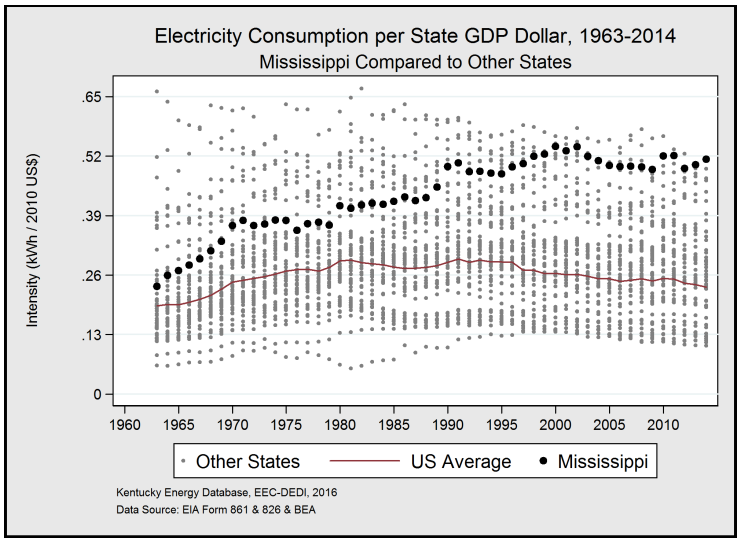



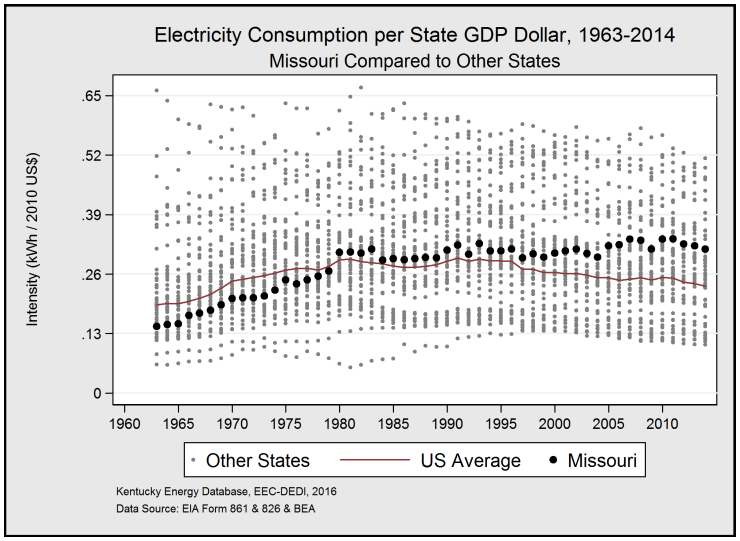



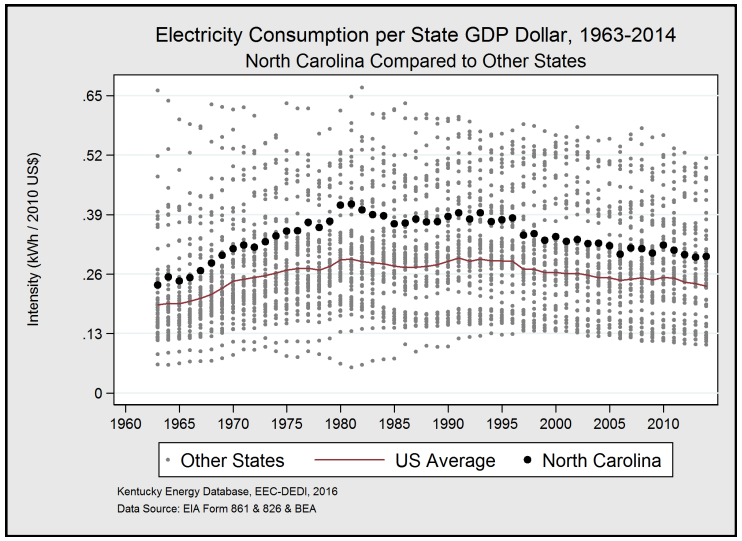



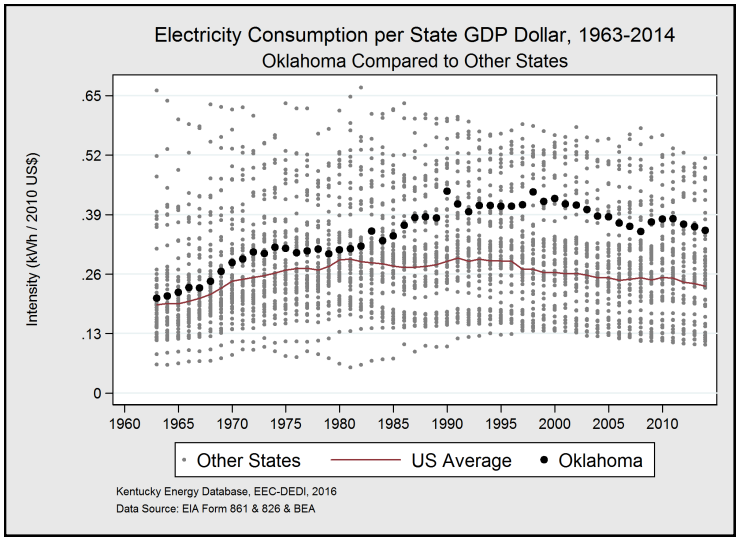
# Historical Electricity Intensity per GDP Dollar

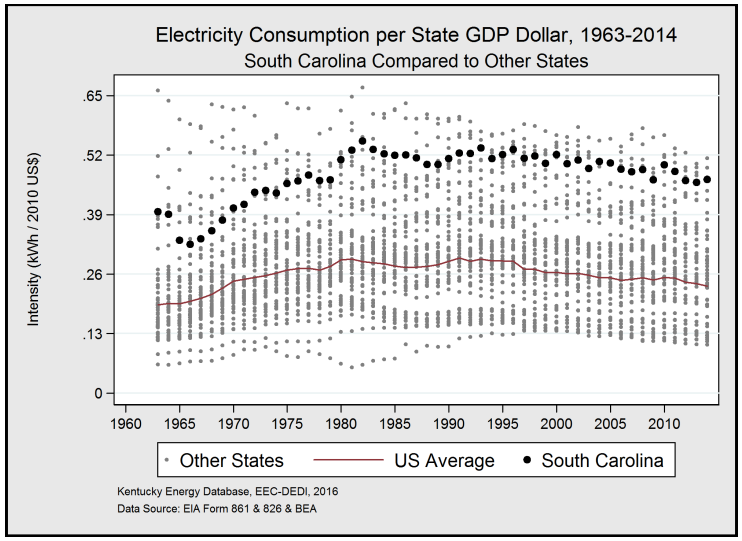


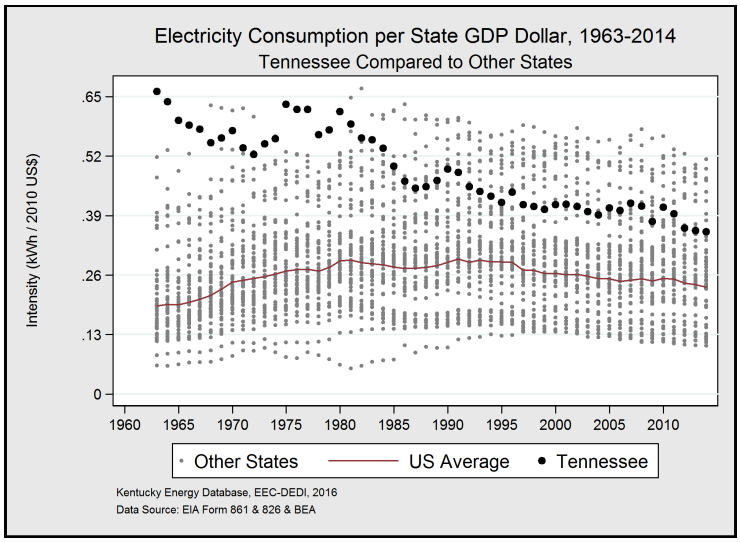



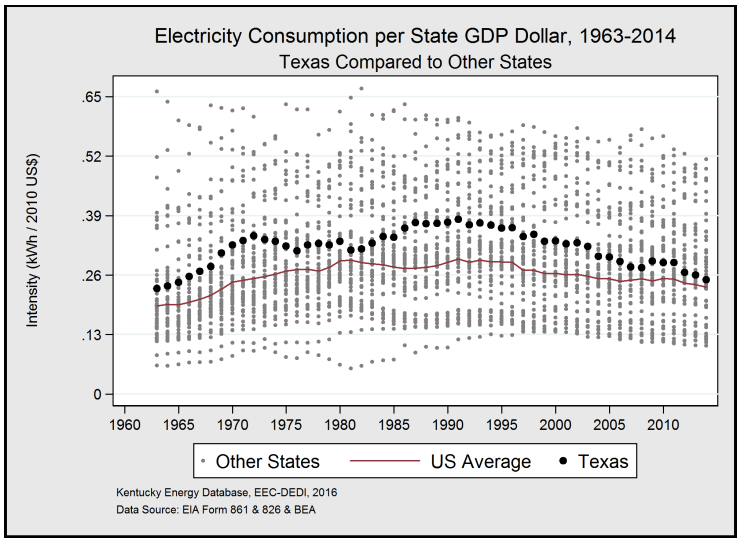



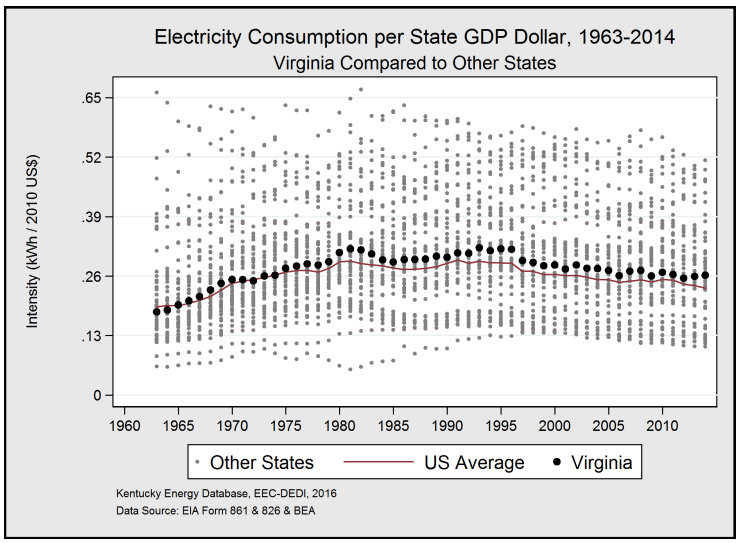



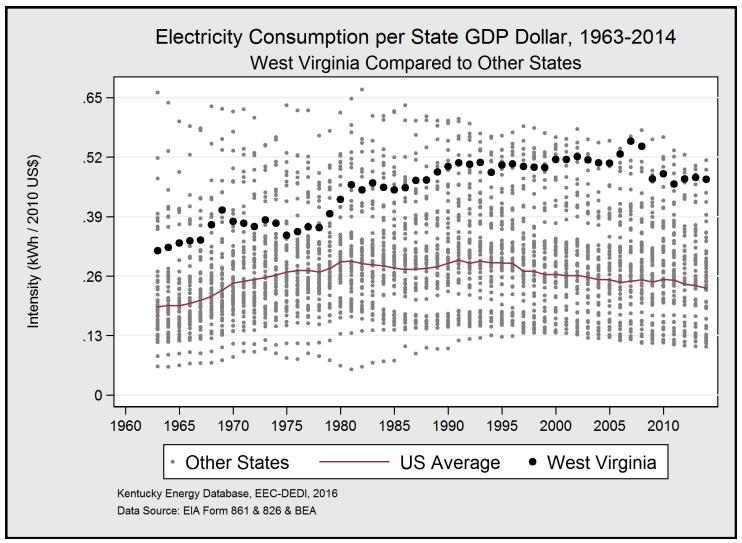



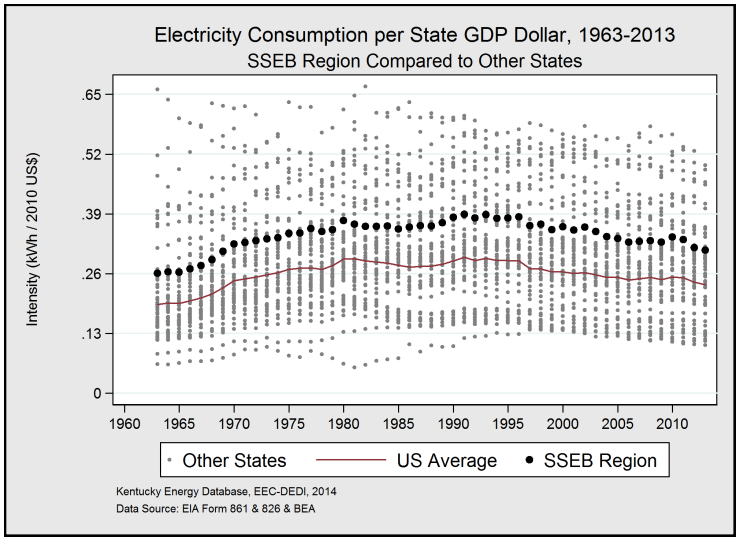
# Historical Electricity Intensity per GDP Dollar



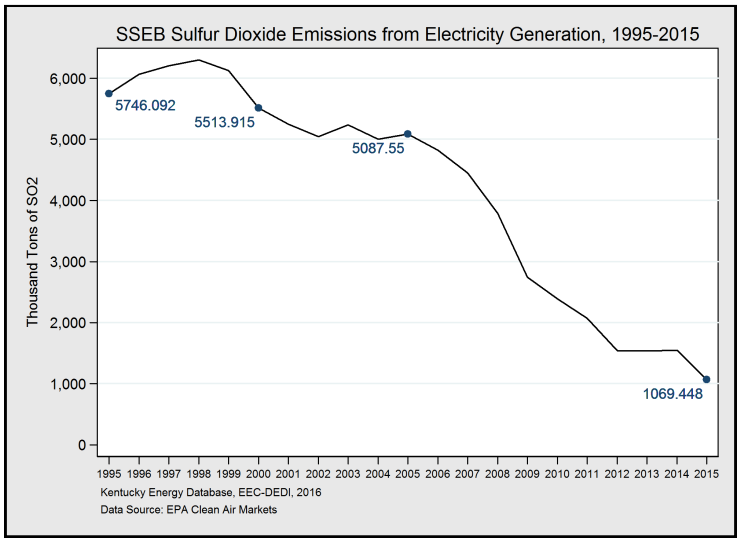



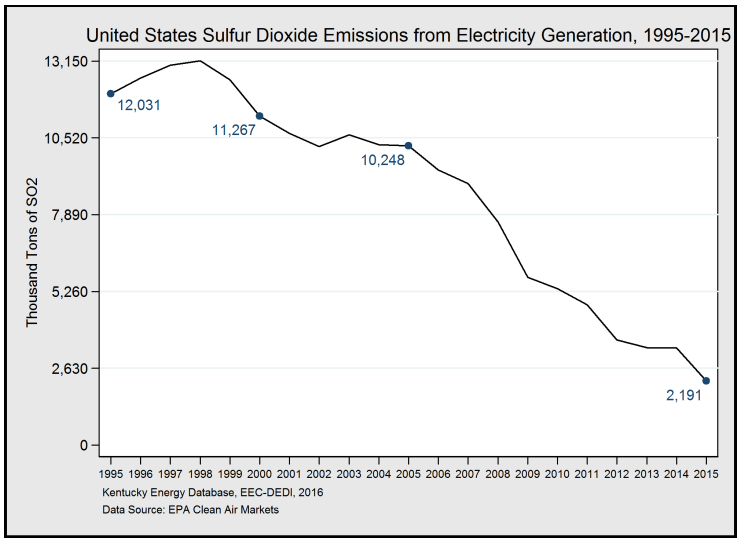



# SSEB Region Electric Power Emissions



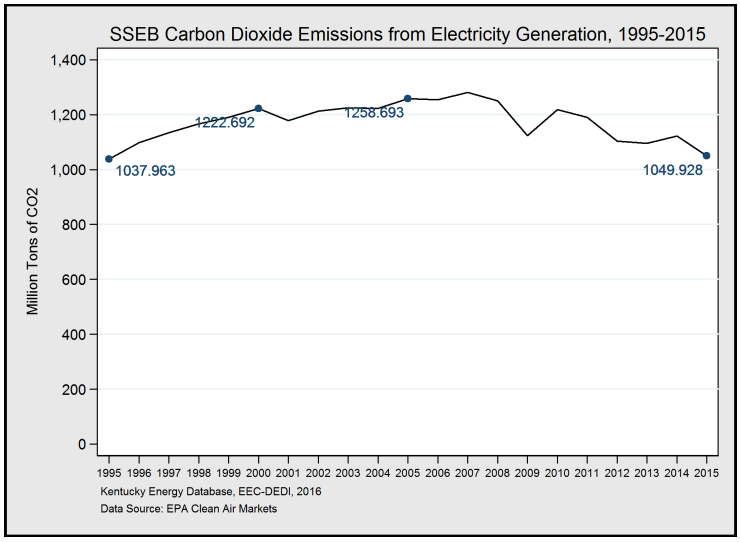



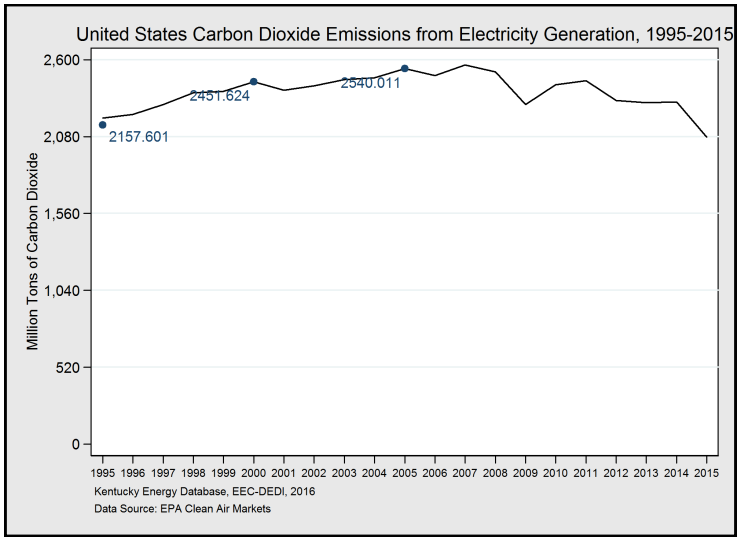

| Emission | 2015 Tons | Since 2005 |
|---|---|---|
| Sulfur Dioxide | 1,069,448 | -79% |

| Emission | 2015 Tons | Since 2005 |
|---|---|---|
| Sulfur Dioxide | 2,191,000 | -79% |

| Emission | 2015 Tons | Since 2005 |
|---|---|---|
| Carbon Dioxide | 1,049,928,000 | -17% |

| Emission | 2015 Tons | Since 2005 |
|---|---|---|
| Carbon Dioxide | 2,092,917,956 | -18% |




Since 1995, sulfur dioxide ($SO_2$) emissions have fallen by 82 percent across the United States despite a 24 percent increase in electricity consumption. At the same time, the SSEB region decreased its $SO_2$ emissions by 81 percent while increasing its electricity consumption by 26 percent. This decrease was achieved through pollution mitigation measures at power plants, including the use of lower-sulfur coal and the installation of desulfurization equipment.

Since 1995, Carbon dioxide ($CO_2$) emissions for the generation of electrical power have risen by 1.1 percent in the SSEB region and decreased 3.0 percent in the United States. Since 2008, $CO_2$ emissions have fallen by 17 percent nationally due to decreased electricity consumption, increased renewable generation, as well as decreased coal-fired generation—the nation's leading source of carbon emissions.

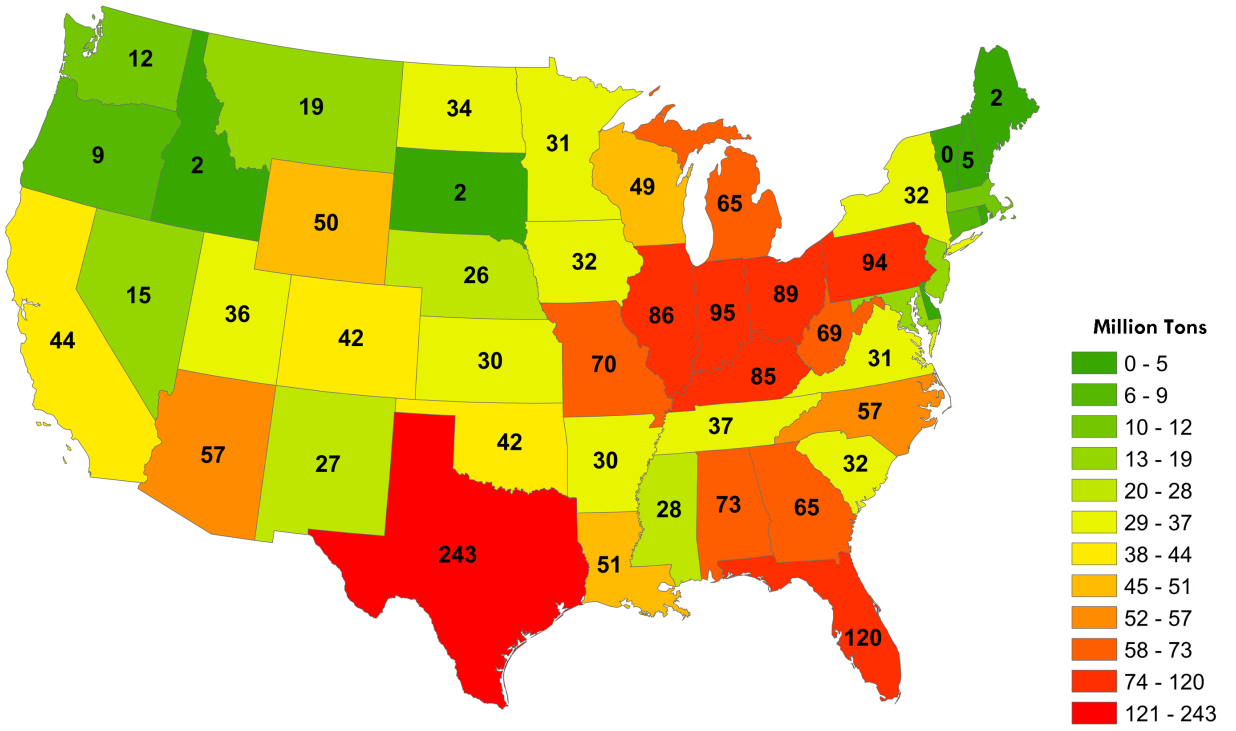
# Electric Power Emissions by State, 2015

| Rank | State* | $CO_2$ Intensity (Lbs./MWh) | $CO_2$ Emissions (Million Tons) | $NO_x$ Intensity (Lbs./MWh) | $NO_x$ Emissions (Tons) | $SO_2$ Intensity (Lbs./MWh) | $SO_2$ Emissions (Tons) |
|---|---|---|---|---|---|---|---|
| 1 | Idaho | 212 | 1.6 | 0.034 | 256 | 0.001 | 8 |
| 2 | Washington | 214 | 11.7 | 0.112 | 6,154 | 0.044 | 2,424 |
| 3 | Maine | 293 | 1.8 | 0.118 | 720 | 0.290 | 1,762 |
| 4 | Oregon | 307 | 9.0 | 0.112 | 3,300 | 0.157 | 4,618 |
| 5 | New Jersey | 426 | 16.0 | 0.070 | 2,614 | 0.012 | 467 |
| 6 | Connecticut | 433 | 8.1 | 0.089 | 1,676 | 0.062 | 1,158 |
| 7 | South Dakota | 443 | 2.2 | 0.670 | 3,259 | 0.988 | 4,807 |
| 8 | California | 444 | 44.0 | 0.035 | 3,423 | 0.002 | 232 |
| 9 | Vermont | 453 | 0.5 | 0.145 | 151 | 0.001 | 2 |
| 10 | New York | 453 | 31.7 | 0.159 | 11,139 | 0.121 | 8,448 |
| 11 | New Hampshire | 499 | 5.0 | 0.215 | 2,168 | 0.180 | 1,813 |
| 12 | South Carolina | 665 | 32.1 | 0.246 | 11,865 | 0.212 | 10,253 |
| 13 | Delaware | 716 | 2.8 | 0.255 | 986 | 0.211 | 817 |
| 14 | Virginia | 732 | 30.9 | 0.409 | 17,230 | 0.304 | 12,827 |
| 15 | Massachusetts | 744 | 12.0 | 0.190 | 3,063 | 0.168 | 2,717 |
| 16 | Nevada | 752 | 14.6 | 0.223 | 4,331 | 0.275 | 5,341 |
| 17 | Mississippi | 864 | 28.0 | 0.366 | 11,847 | 0.804 | 26,043 |
| 18 | Pennsylvania | 874 | 94.3 | 0.875 | 94,417 | 1.803 | 194,630 |
| 19 | Rhode Island | 879 | 3.1 | 0.155 | 544 | 0.005 | 19 |
| 20 | North Carolina | 887 | 57.2 | 0.550 | 35,486 | 0.426 | 27,490 |
| 21 | Illinois | 891 | 86.5 | 0.365 | 35,378 | 0.975 | 94,659 |
| 22 | Maryland | 910 | 16.6 | 0.473 | 8,614 | 1.065 | 19,386 |
| 23 | Louisiana | 946 | 50.9 | 0.753 | 40,522 | 0.995 | 53,539 |
| 24 | Alabama | 954 | 72.9 | 0.587 | 44,894 | 1.278 | 97,760 |
| 25 | Tennessee | 982 | 37.0 | 0.476 | 17,964 | 1.582 | 59,669 |
| 26 | Arizona | 1,002 | 56.8 | 0.704 | 39,874 | 0.311 | 17,618 |
| 27 | Georgia | 1,006 | 64.5 | 0.457 | 29,318 | 0.496 | 31,785 |
| 28 | Florida | 1,010 | 119.8 | 0.459 | 54,430 | 0.510 | 60,469 |
| | United States | 1016.7 | 2077.8 | 0.659 | 1,347,066 | 1.072 | 2,191,353 |
| | SSEB | 1056.8 | 1021.9 | 0.608 | 588,389 | 1.079 | 1,043,405 |
| 29 | Texas | 1,079 | 243.1 | 0.476 | 107,235 | 1.155 | 260,122 |
| 30 | Arkansas | 1,081 | 30.1 | 0.848 | 23,613 | 1.636 | 45,544 |
| 31 | Minnesota | 1,083 | 31.1 | 0.638 | 18,328 | 0.642 | 18,451 |
| 32 | Oklahoma | 1,107 | 42.1 | 0.722 | 27,449 | 1.629 | 61,971 |
| 33 | Iowa | 1,128 | 32.3 | 0.895 | 25,578 | 1.437 | 41,087 |
| 34 | Michigan | 1,133 | 64.7 | 0.771 | 43,985 | 2.302 | 131,411 |
| 35 | Montana | 1,288 | 19.0 | 1.177 | 17,385 | 0.749 | 11,070 |
| 36 | Nebraska | 1,327 | 26.1 | 1.188 | 23,329 | 3.257 | 63,991 |
| 37 | Kansas | 1,332 | 30.5 | 0.766 | 17,536 | 0.605 | 13,851 |
| 38 | Ohio | 1,461 | 89.2 | 1.058 | 64,617 | 2.903 | 177,246 |
| 39 | Wisconsin | 1,475 | 49.2 | 0.596 | 19,854 | 0.759 | 25,289 |
| 40 | Colorado | 1,602 | 42.1 | 1.359 | 35,672 | 0.872 | 22,906 |
| 41 | New Mexico | 1,654 | 27.2 | 2.755 | 45,262 | 0.708 | 11,626 |
| 42 | Missouri | 1,672 | 69.9 | 1.075 | 44,942 | 2.695 | 112,676 |
| 43 | Utah | 1,702 | 35.8 | 2.239 | 47,059 | 0.696 | 14,640 |
| 44 | North Dakota | 1,837 | 33.9 | 2.435 | 44,953 | 2.493 | 46,018 |
| 45 | Indiana | 1,839 | 95.5 | 1.688 | 87,660 | 3.205 | 166,403 |
| 46 | West Virginia | 1,920 | 69.3 | 1.626 | 58,729 | 1.558 | 56,262 |
| 47 | Wyoming | 2,033 | 49.8 | 1.723 | 42,158 | 1.487 | 36,377 |
| 48 | Kentucky | 2,053 | 85.4 | 1.588 | 66,096 | 3.212 | 133,653 |

*Alaska, Hawaii, and Washington D.C. are omitted as they do not report emissions to the EPA's Clean Air Markets database.

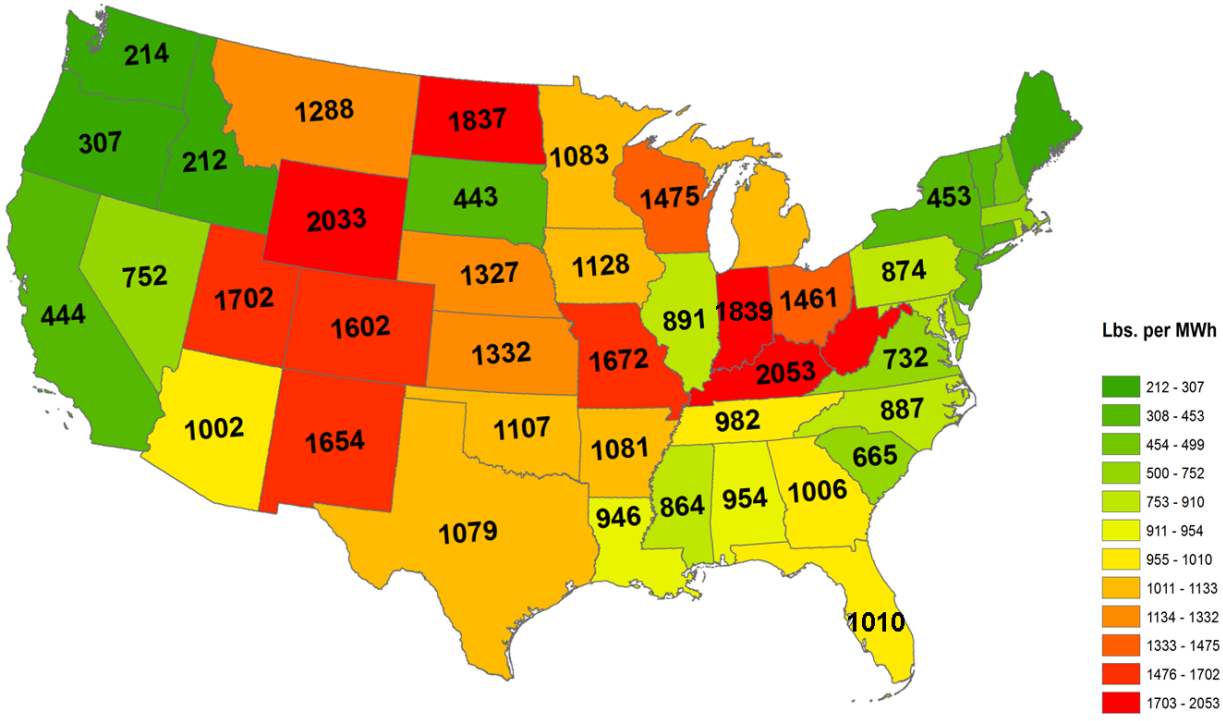
# $CO_2$ Emissions by State

## $CO_2$ Emissions from Electric Power, 2015




Kentucky Energy Database, EEC-DEDI, 2016

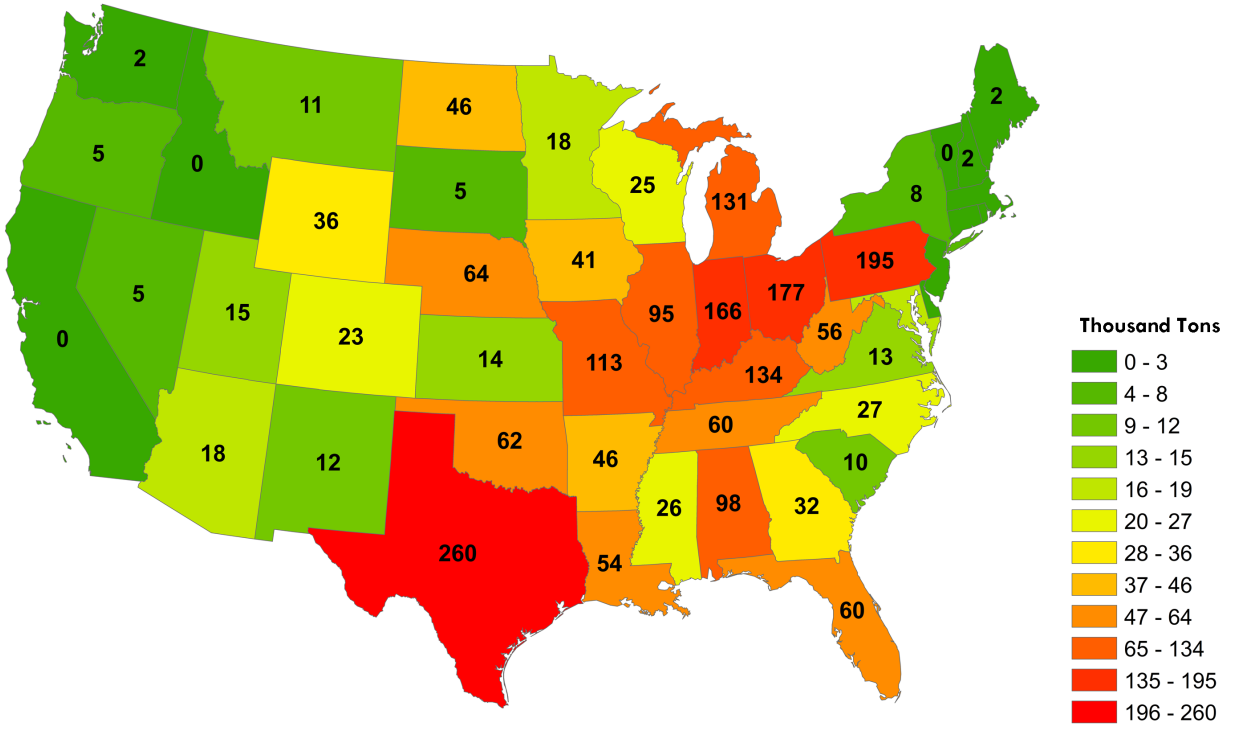
## $CO_2$ Intensity of Electric Power, 2015




Kentucky Energy Database, EEC-DEDI, 2016

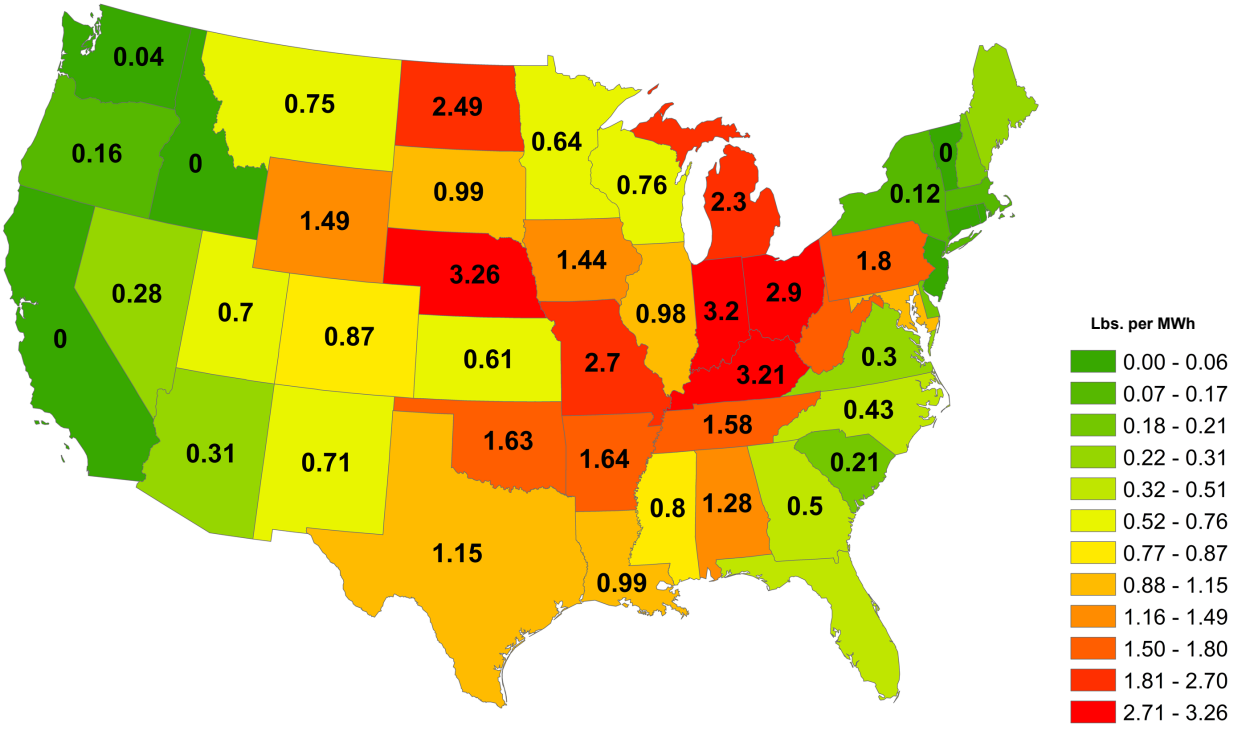
# $SO_2$ Emissions by State

## $SO_2$ Emissions from Electric Power, 2015




Kentucky Energy Database, EEC-DEDI, 2016

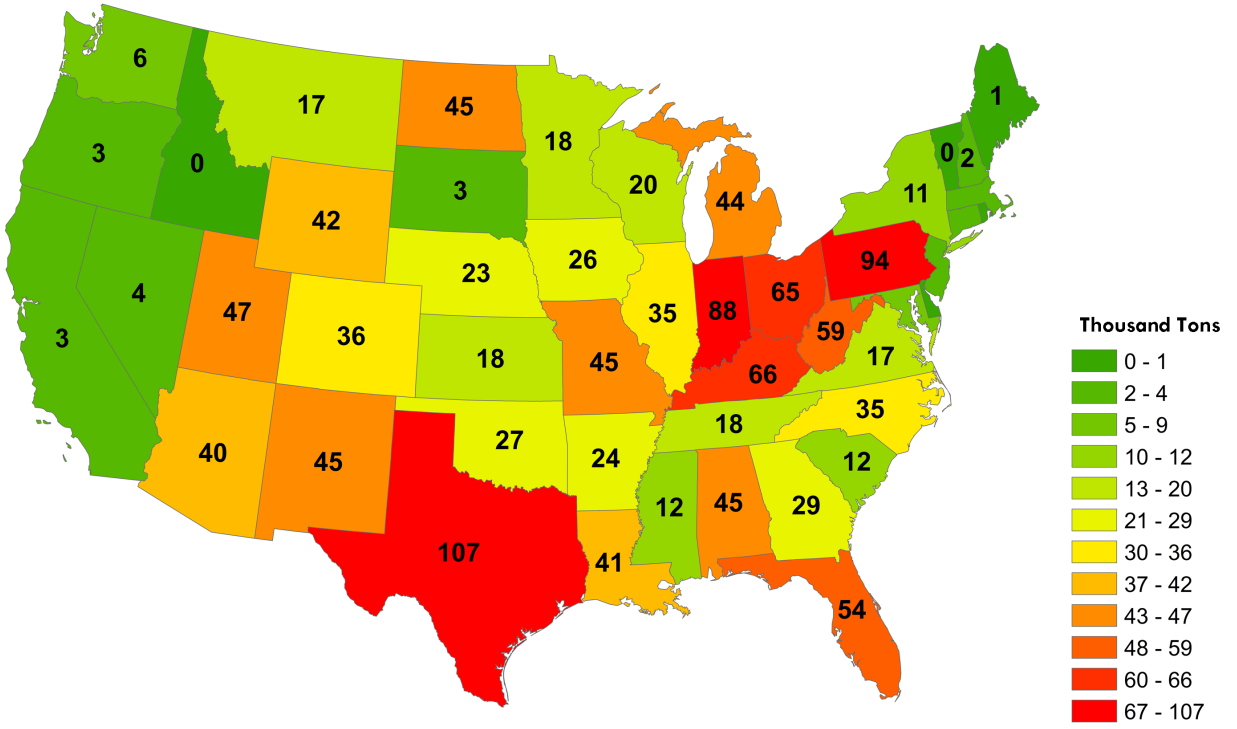
## $SO_2$ Intensity of Electric Power, 2015




Kentucky Energy Database, EEC-DEDI, 2016

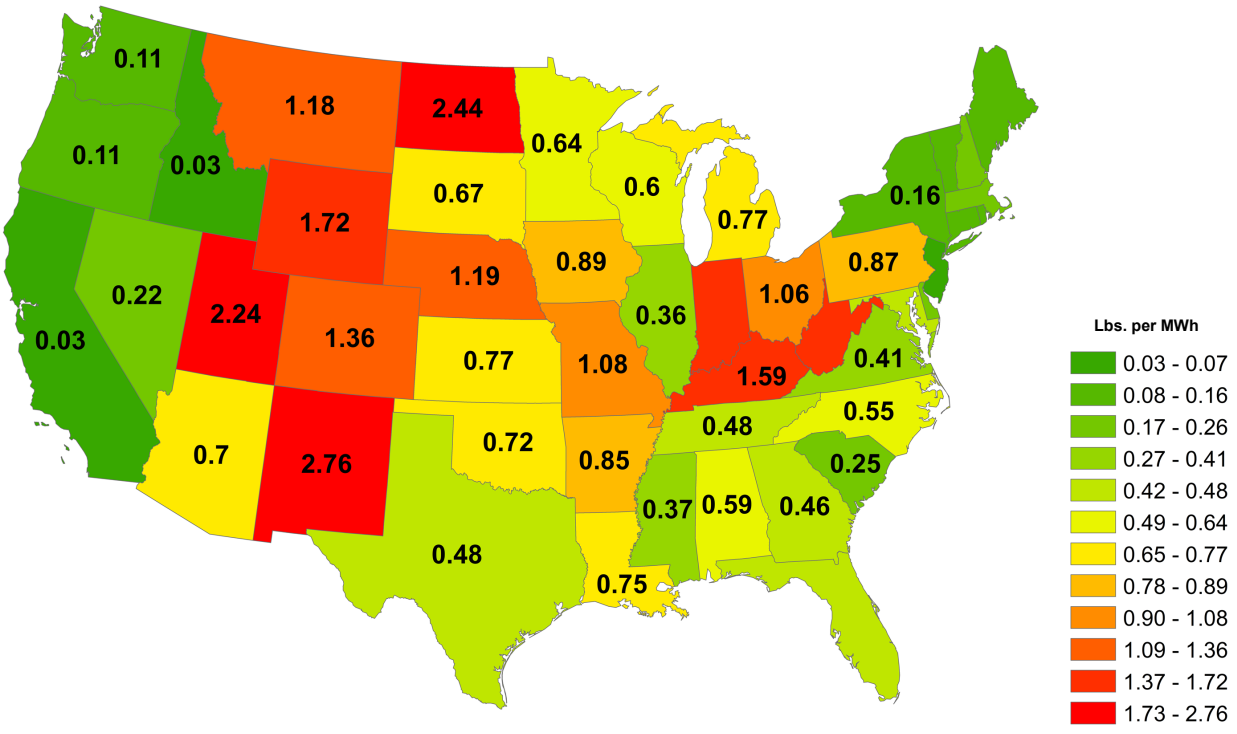
# $NO_x$ Emissions by State

## $NO_X$ Emissions from Electric Power, 2015



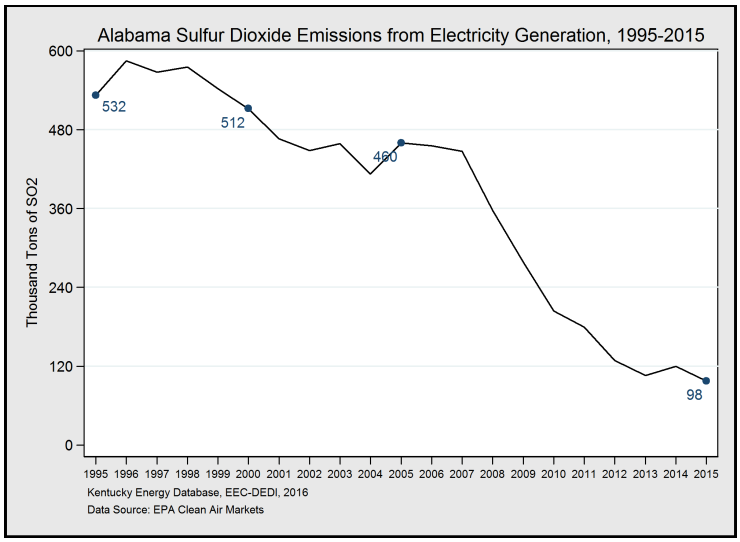

Kentucky Energy Database, EEC-DEDI, 2016

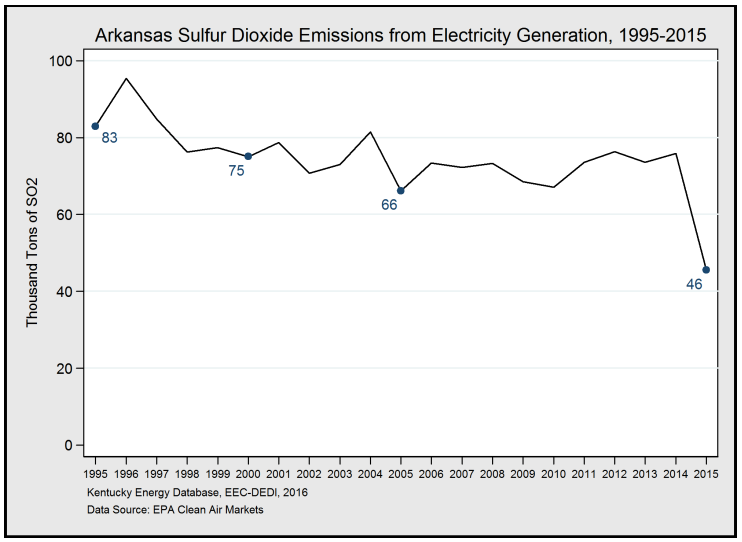
## $NO_X$ Intensity of Electric Power, 2015

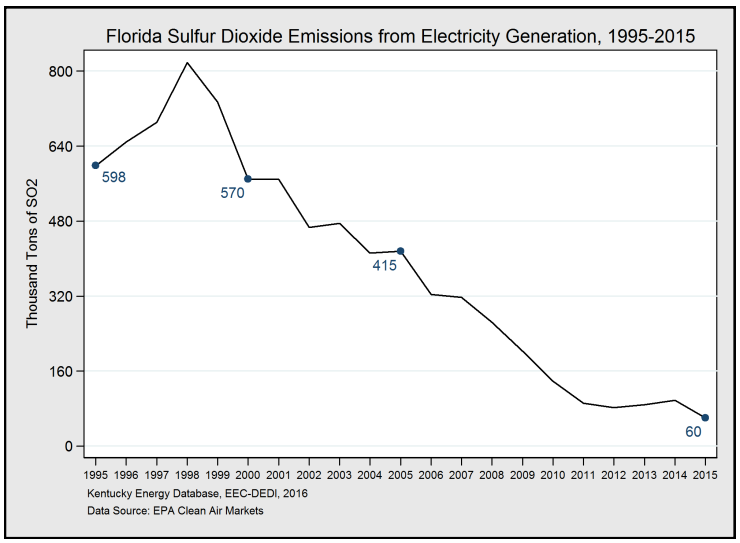


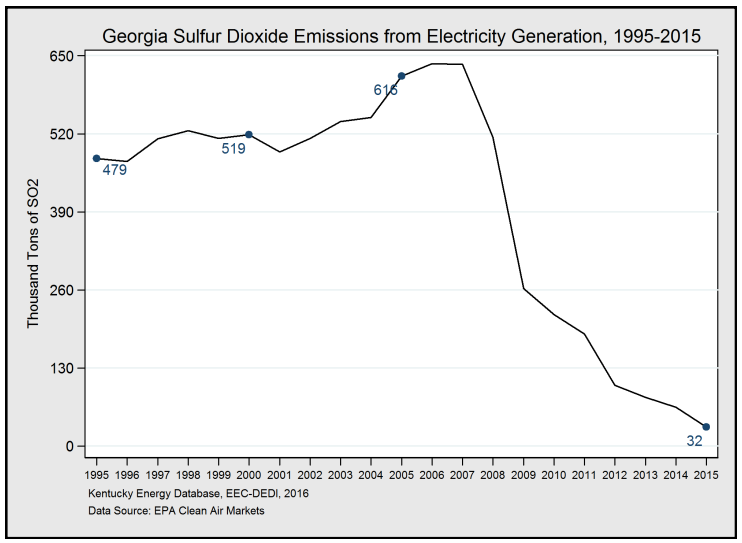

Kentucky Energy Database, EEC-DEDI, 2016

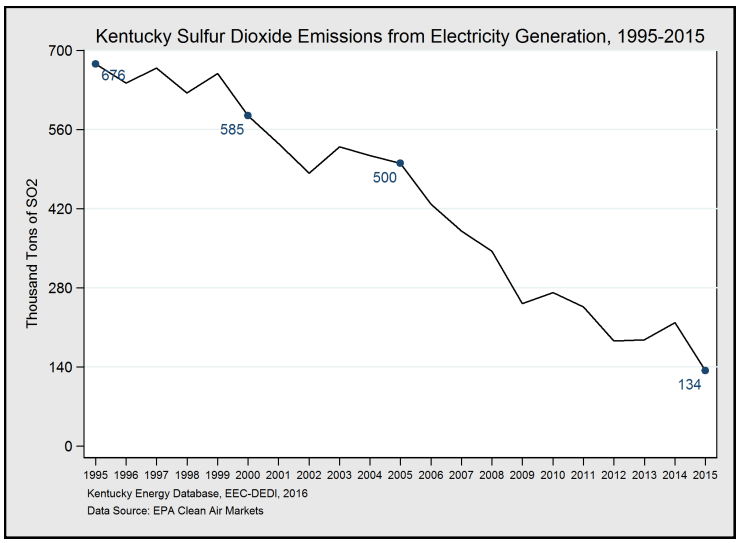
# Historical Electric Power Emissions ($SO_2$)

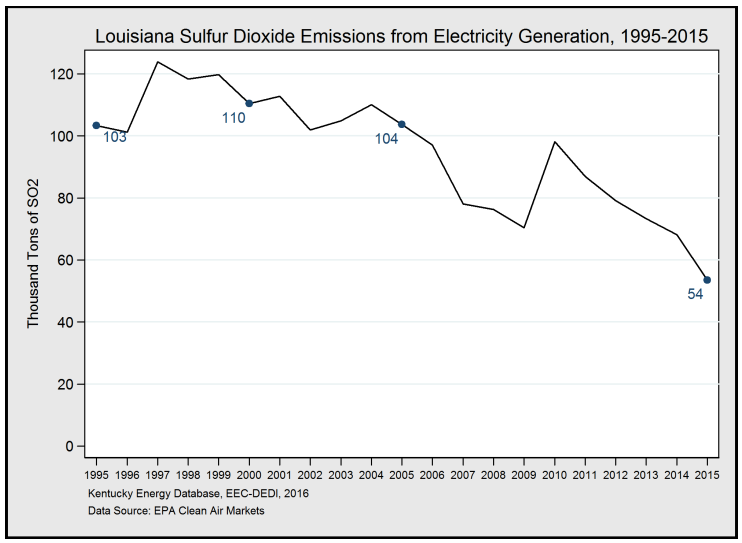


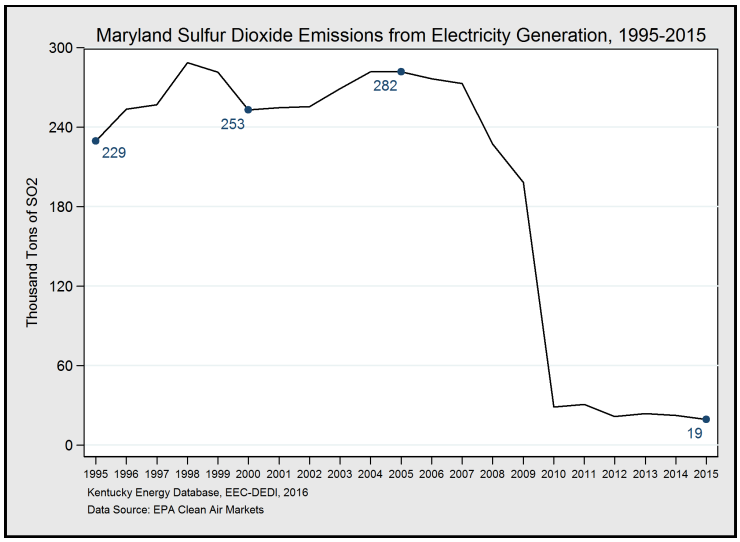



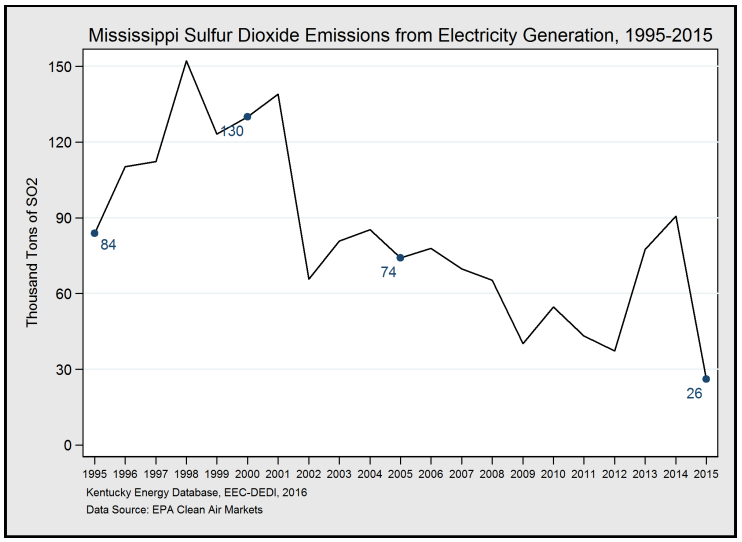



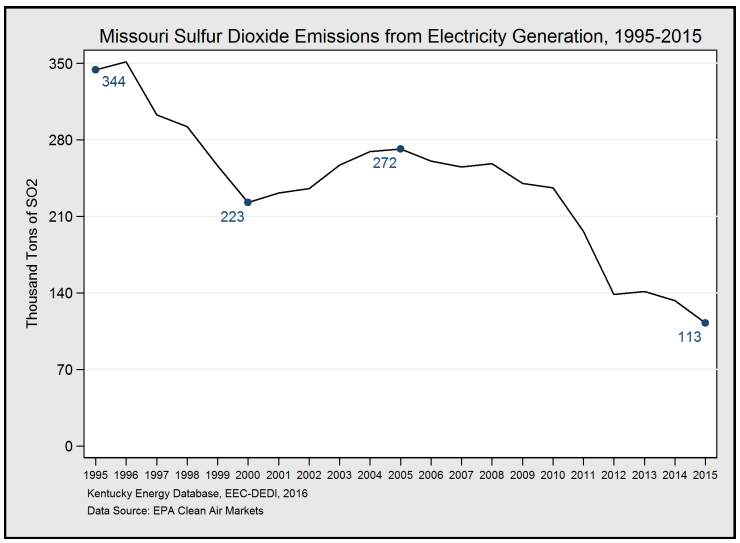



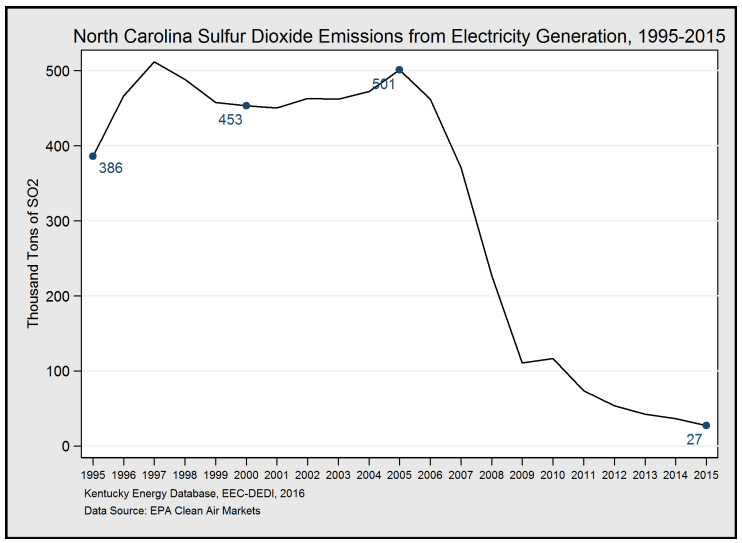



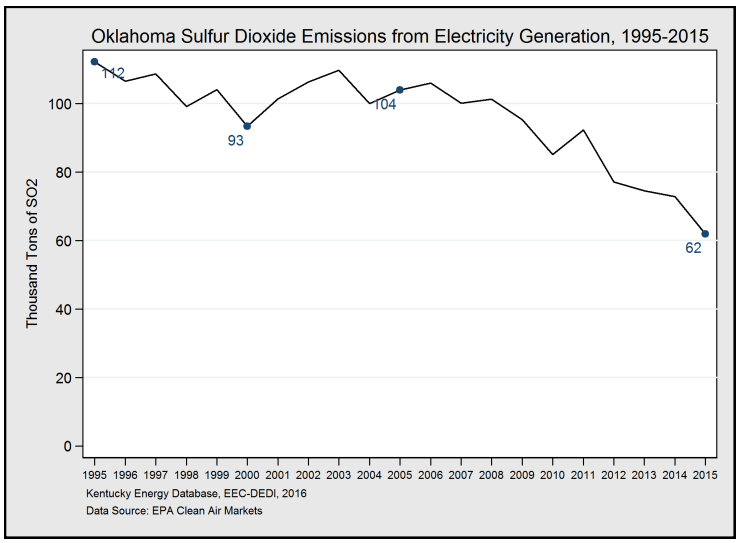
# Historical Electric Power Emissions ($SO_2$)

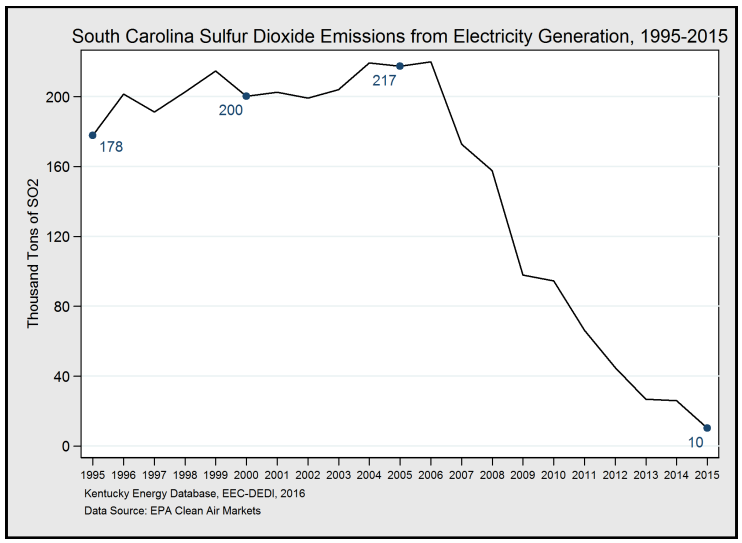


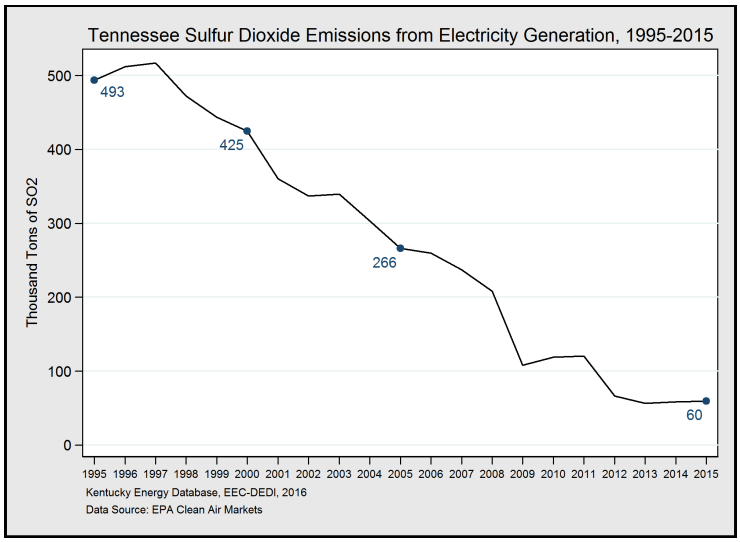



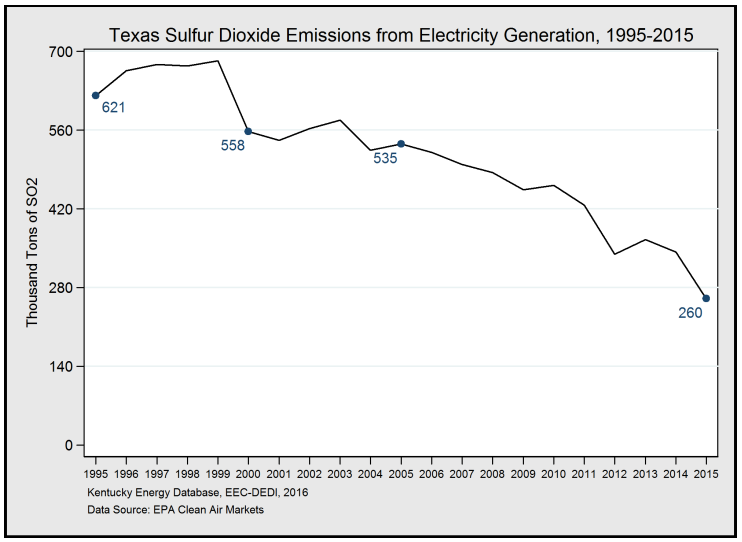



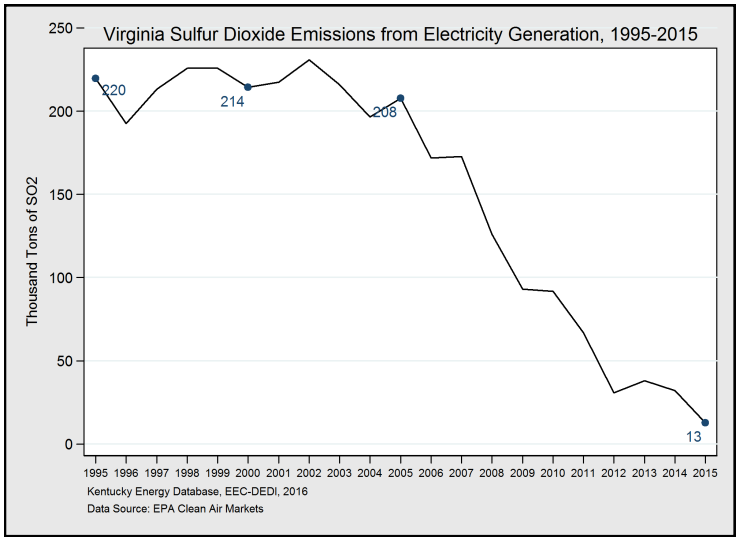



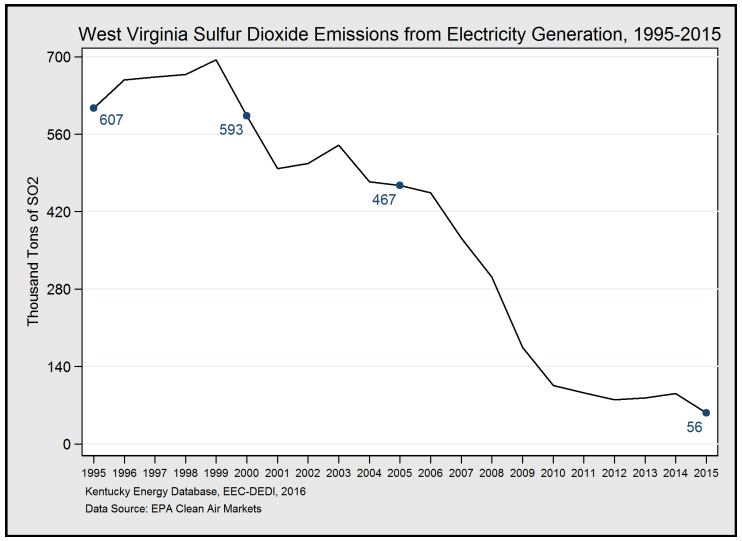



# Historical Electric Power Emissions ($SO_2$)

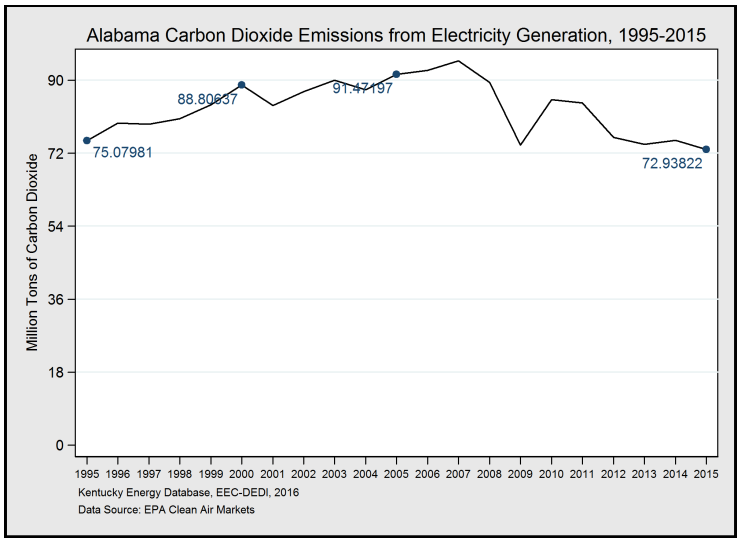


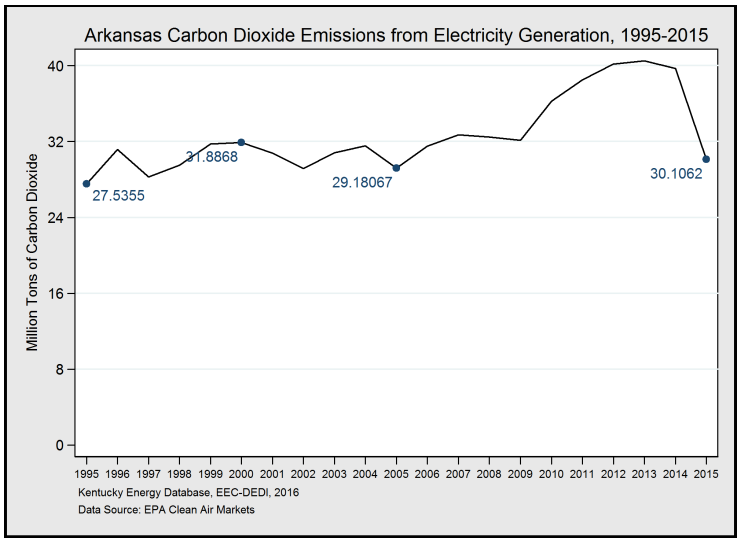



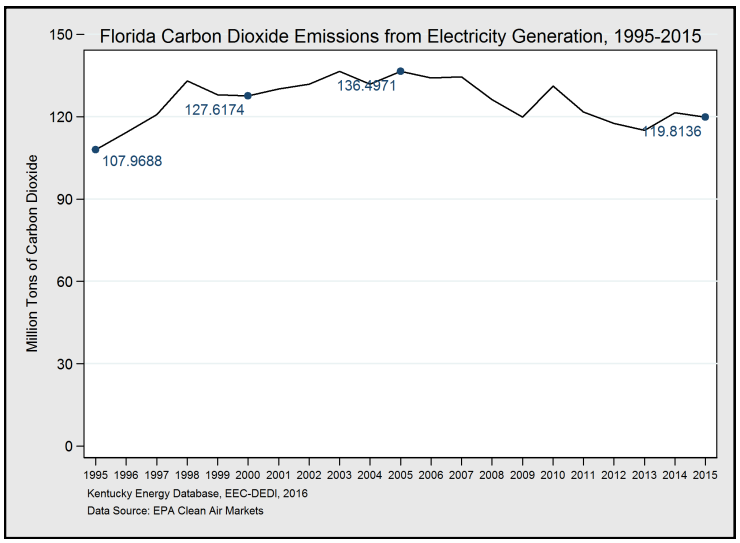



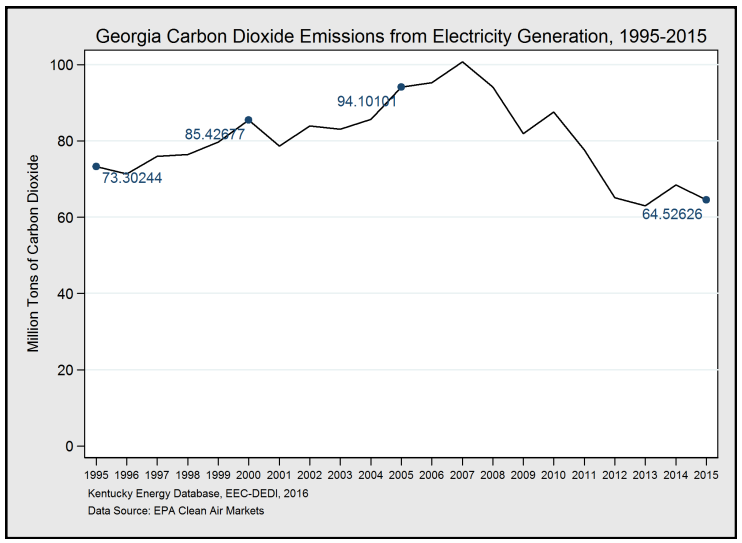



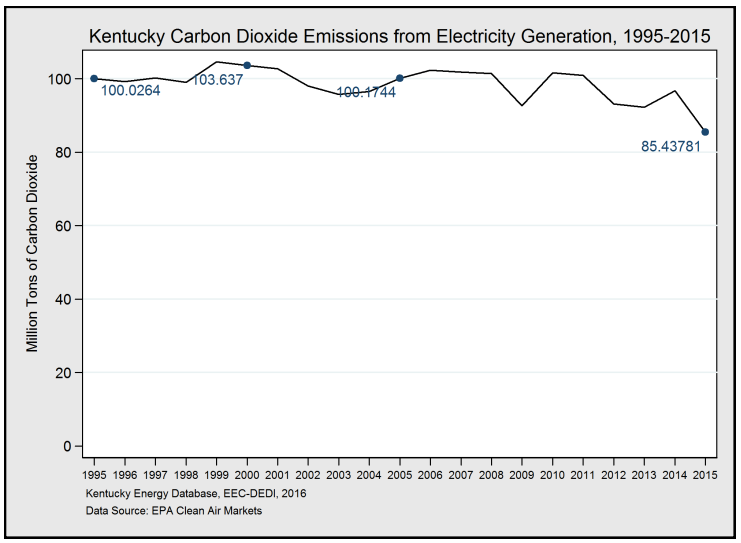
# Historical Electric Power Emissions ($CO_2$)

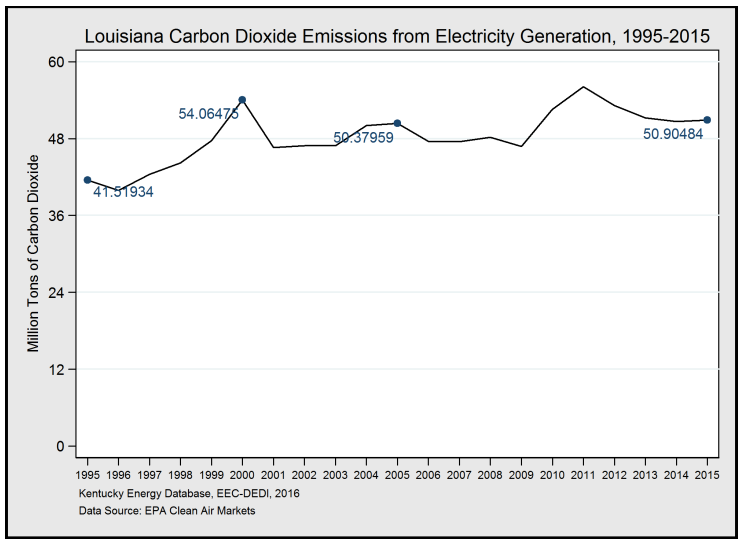


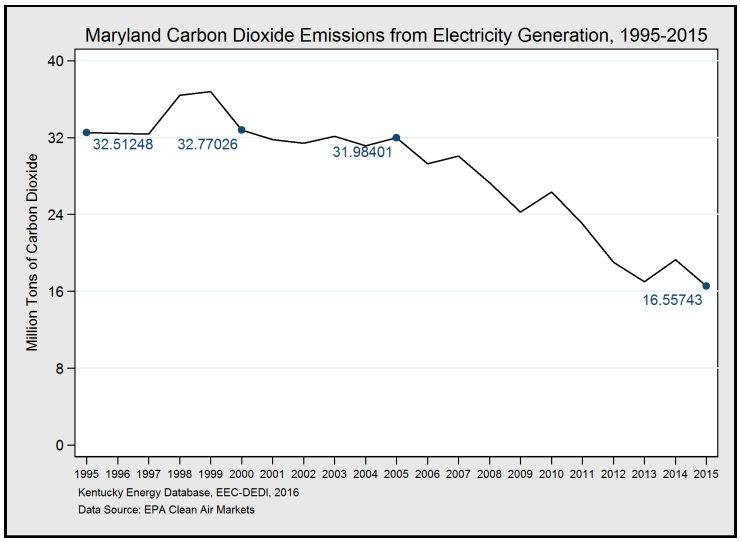



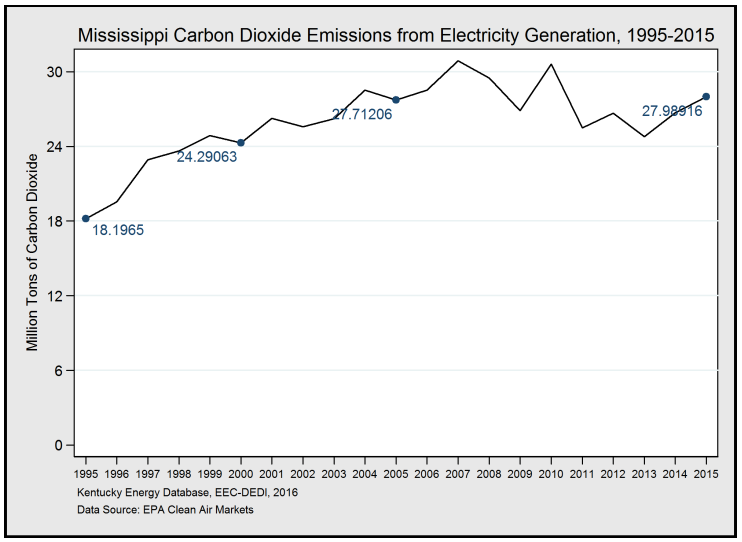



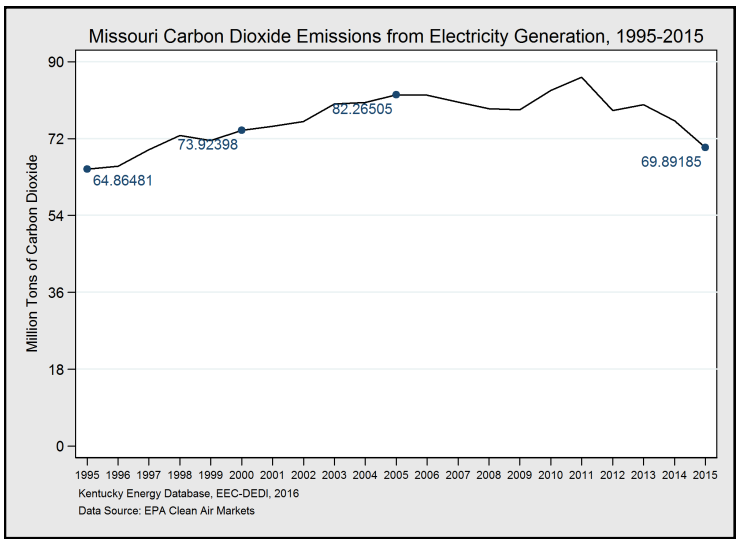



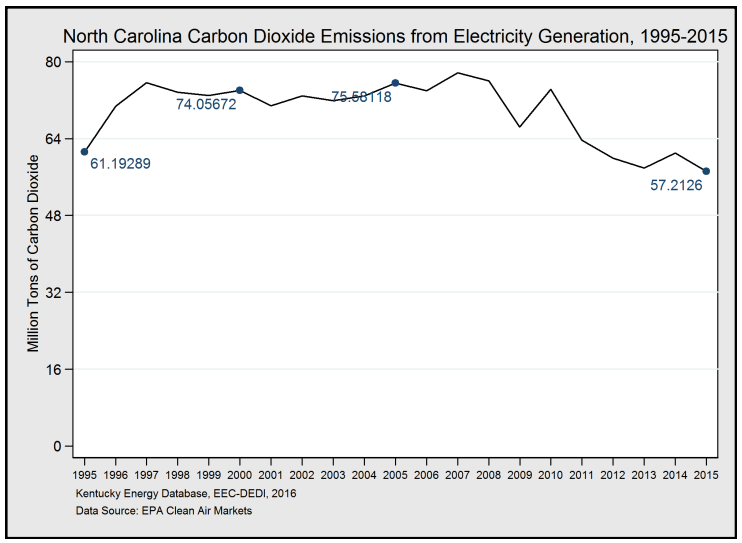



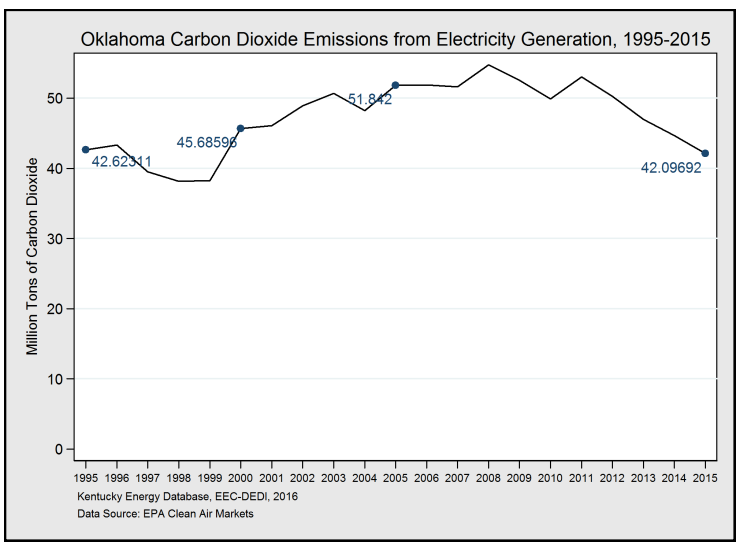
# Historical Electric Power Emissions ($CO_2$)

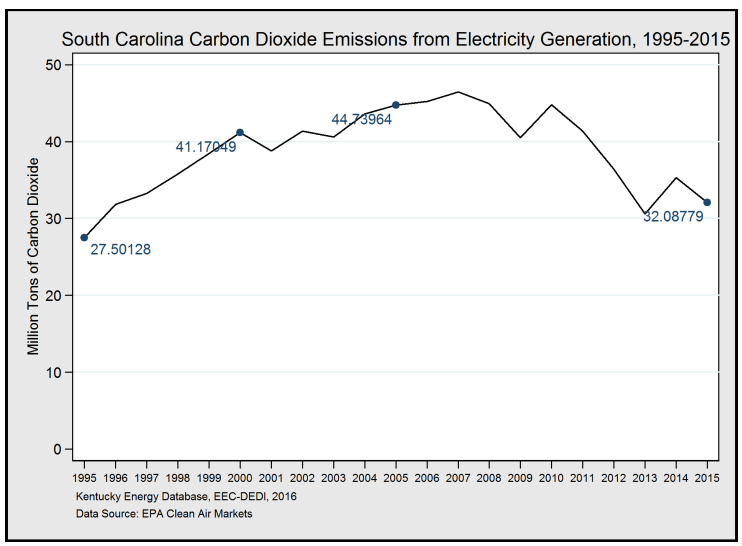


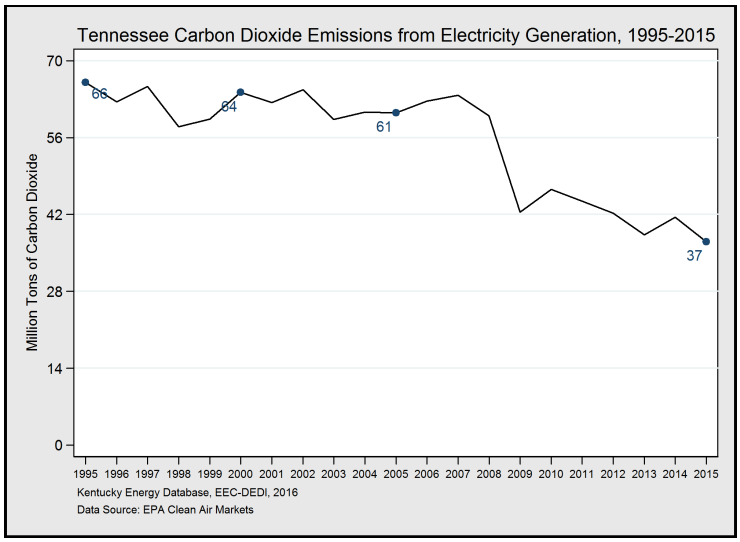



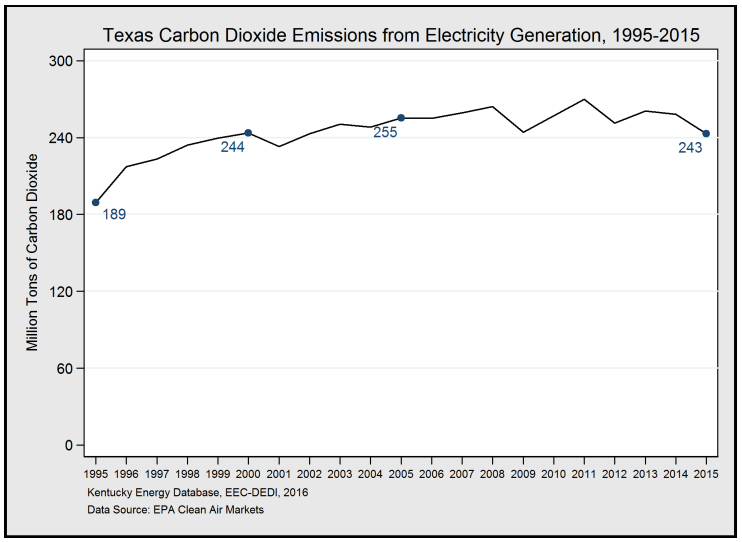



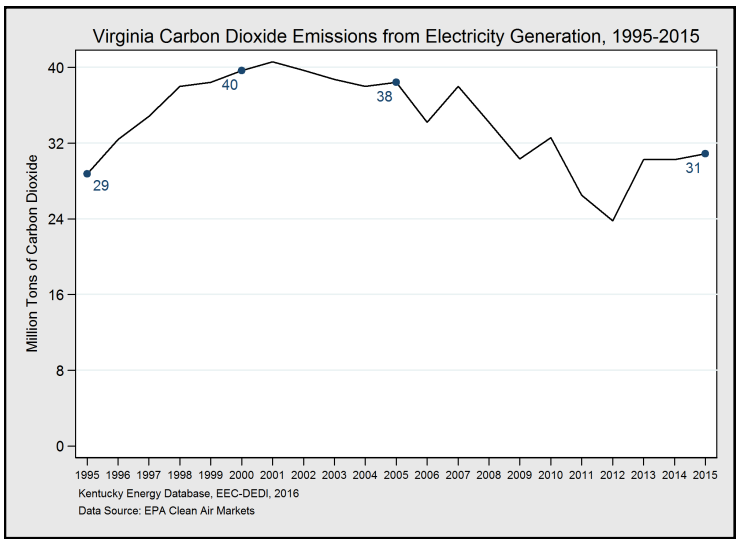



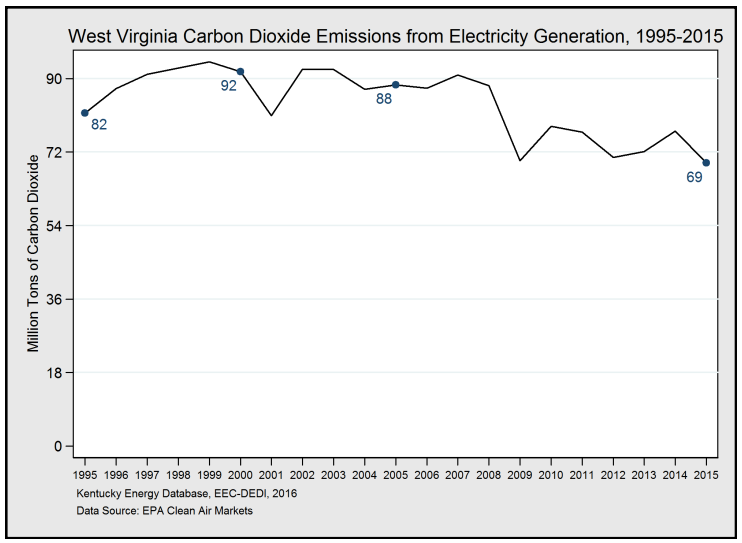



# Historical Electric Power Emissions ($CO_2$)

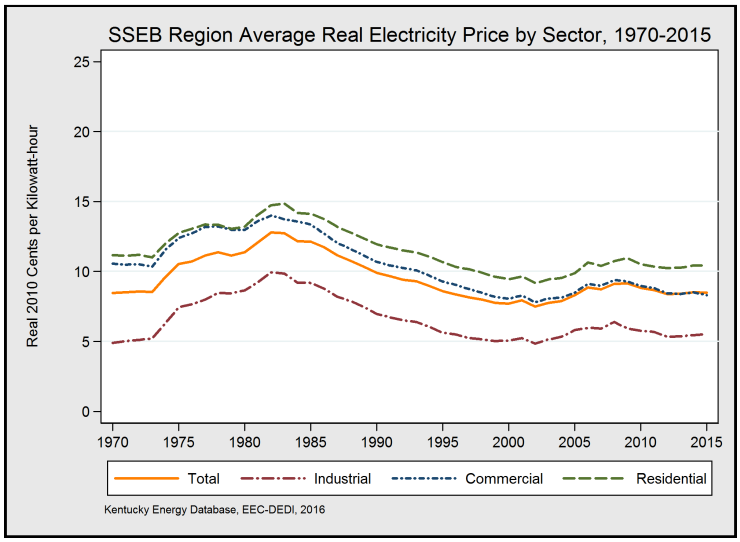


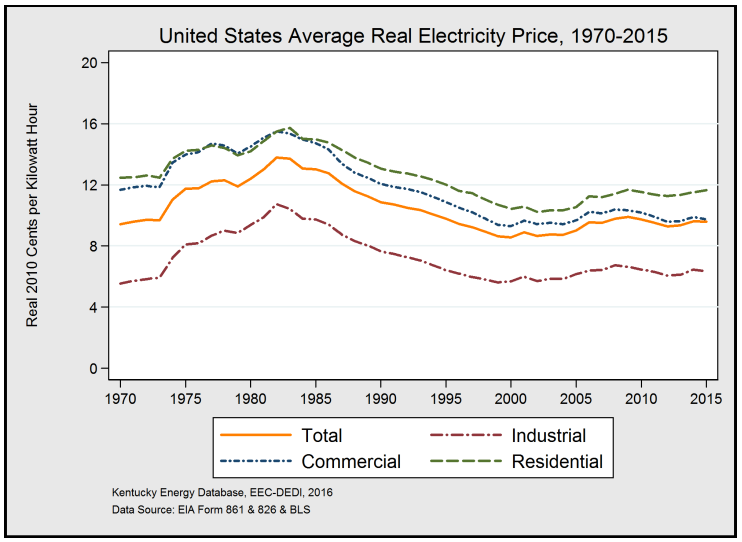



# SSEB Region Price of Electricity, 2015




| Sector | Cents / kWh | Inflation Adjusted Change Since 2005 |
|---|---|---|
| Total | 9.23 | +2.0% |
| Residential | 11.3 | +5.2% |
| Commercial | 9.0 | -2.4% |
| Industrial | 6.0 | -5.2% |

| Sector | Cents / kWh | Inflation Adjusted Change Since 2005 |
|---|---|---|
| Total | 10.4 | +6.0% |
| Residential | 12.7 | +10.2% |
| Commercial | 10.6 | +0.4% |
| Industrial | 6.9 | +2.7% |

Electricity price is measured in terms of cents per kilowatt-hour of electricity consumed. While the price of electricity varies from state to state and from one utility to another, the above graphic illustrates the average price of electricity delivered to each economic sector.

After adjusting for inflation in the price of all consumer goods, relative electricity prices actually fell from 1983 to 2000, and have risen thereafter with the price of fossil fuel inputs.

The two most influential factors explaining the changes in both nominal and real electricity prices in the SSEB region and nationally have been the type of generation portfolio developed within a state and the price of fossil fuel inputs for the electric power sector. Specifically, these factors involve the type of generation technology (i.e. coal, gas, nuclear, and renewables) used within a state, the share of each technology in supplying baseload electricity, and the price of the primary fossil fuel inputs.

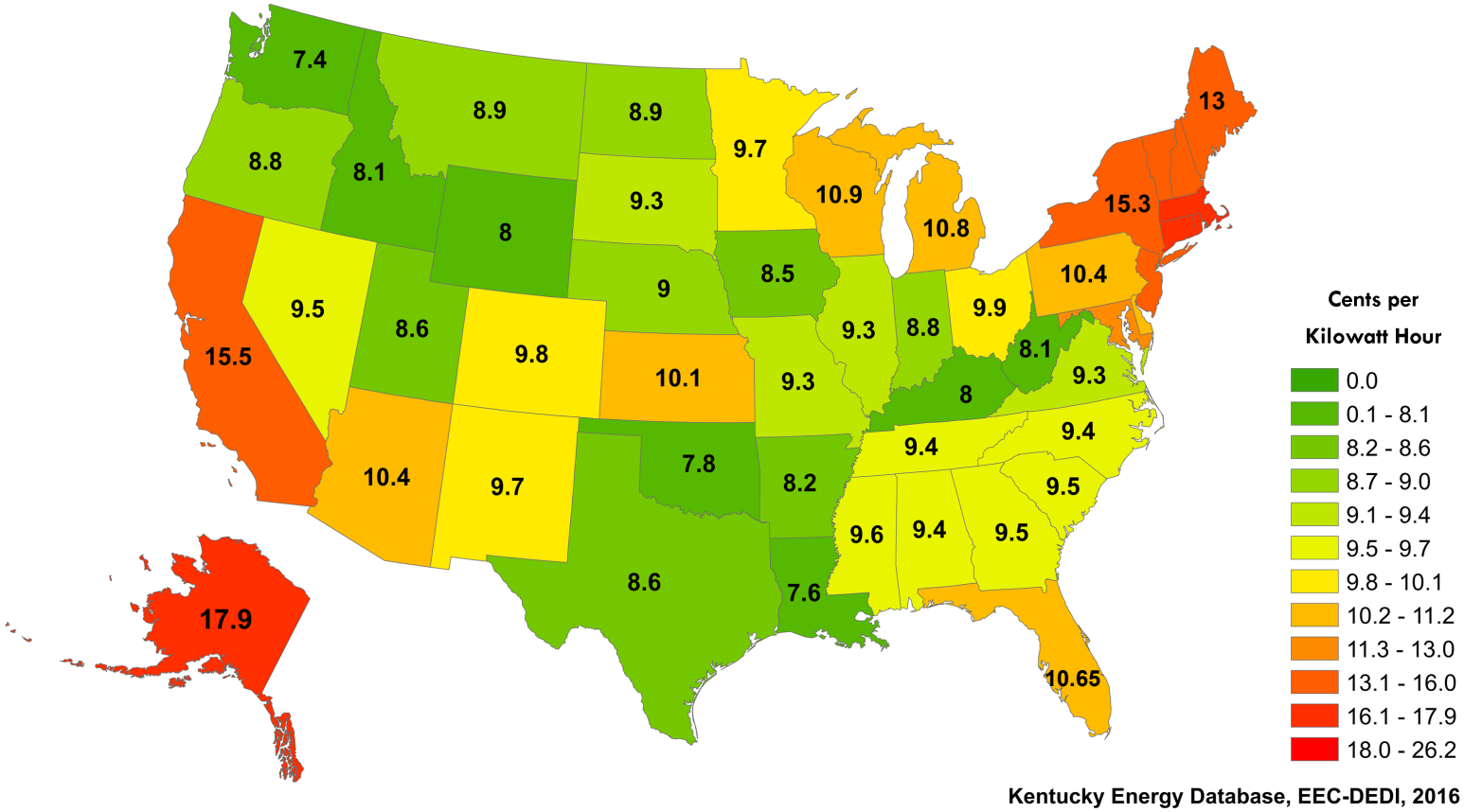
Electricity prices in the SSEB region in 2015 were 11 percent lower than the national average. Industrial electricity prices in the region averaged 6.0 cents per kWh.

*Nominal electricity prices by state and economic sector are based on aggregated data from individual electric utilities derived from United States Form EIA-861 and Form EIA-826. To control for the changing value of the United States Dollar, nominal prices were converted to Real 2010 US$ using the Bureau of Labor Statistics (BLS) Consumer Price Index (CPI).*

# Electricity Price by State, 2015

| Rank | State | Primary Source | Electricity Price (Cents per kWh) | Inflation Adjusted 1 Year Change | Inflation Adjusted 5 Year Change |
|---|---|---|---|---|---|
| 1 | Washington | Hydroelectric | 7.41 | 5.04% | 3.44% |
| 2 | Louisiana | Natural Gas | 7.64 | 2.02% | -7.08% |
| 3 | Oklahoma | Natural Gas | 7.83 | -2.60% | -4.47% |
| 4 | Wyoming | Coal | 7.95 | 5.13% | 21.00% |
| 5 | Kentucky | Coal | 8.03 | -0.88% | 11.07% |
| 6 | West Virginia | Coal | 8.12 | 6.07% | 1.38% |
| 7 | Idaho | Hydroelectric | 8.12 | 2.35% | 14.20% |
| 8 | Arkansas | Coal | 8.15 | 3.49% | 6.52% |
| 9 | Iowa | Coal | 8.47 | 3.85% | 1.84% |
| 10 | Utah | Coal | 8.61 | 3.87% | 15.38% |
| 11 | Texas | Natural Gas | 8.63 | -1.19% | -12.95% |
| 12 | Indiana | Coal | 8.79 | -2.04% | 6.68% |
| 13 | Oregon | Hydroelectric | 8.82 | 1.48% | 7.41% |
| 14 | North Dakota | Coal | 8.85 | 6.69% | 15.51% |
| 15 | Montana | Coal | 8.93 | 8.05% | 5.99% |
| 16 | Nebraska | Coal | 9.04 | 2.17% | 10.66% |
|  | Southern States Average | Natural Gas | 9.23 | -0.21% | -1.13% |
| 17 | Illinois | Nuclear | 9.28 | 0.75% | -5.68% |
| 18 | Missouri | Coal | 9.30 | 1.96% | 10.02% |
| 19 | South Dakota | Hydroelectric | 9.31 | 2.74% | 9.51% |
| 20 | Virginia | Natural Gas | 9.31 | 1.40% | -1.42% |
| 21 | Tennessee | Coal | 9.35 | -0.19% | 0.65% |
| 22 | North Carolina | Nuclear | 9.36 | 0.17% | -0.65% |
| 23 | Alabama | Natural Gas | 9.37 | 1.22% | -0.03% |
| 24 | South Carolina | Nuclear | 9.48 | -2.09% | 2.67% |
| 25 | Nevada | Natural Gas | 9.48 | -2.67% | -8.95% |
| 26 | Georgia | Natural Gas | 9.52 | -5.18% | -0.73% |
| 27 | Mississippi | Natural Gas | 9.55 | 0.96% | 5.29% |
| 28 | New Mexico | Coal | 9.68 | 1.38% | 8.99% |
| 29 | Minnesota | Coal | 9.69 | 2.91% | 6.89% |
| 30 | Colorado | Coal | 9.78 | -2.47% | -0.54% |
| 31 | Ohio | Coal | 9.90 | 2.45% | 0.43% |
| 32 | Kansas | Coal | 10.06 | 1.04% | 11.60% |
| 33 | Arizona | Coal | 10.40 | 2.12% | -1.22% |
| 34 | Pennsylvania | Nuclear | 10.41 | 1.81% | -6.24% |
|  | United States Average | Coal | 10.42 | 0.51% | -1.60% |
| 35 | Florida | Natural Gas | 10.65 | -1.24% | -7.41% |
| 36 | Michigan | Coal | 10.84 | -1.54% | 1.68% |
| 37 | Wisconsin | Coal | 10.93 | 3.43% | 3.69% |
| 38 | Delaware | Natural Gas | 11.21 | 2.45% | -13.84% |
| 39 | District of Columbia | Natural Gas | 12.08 | -0.38% | -16.75% |
| 40 | Maryland | Nuclear | 12.14 | 0.20% | -12.08% |
| 41 | Maine | Hydroelectric | 12.97 | 2.42% | -7.04% |
| 42 | New Jersey | Natural Gas | 13.93 | 0.88% | -12.40% |
| 43 | Vermont | Hydroelectric | 14.36 | -1.53% | -0.18% |
| 44 | New York | Natural Gas | 15.28 | -6.10% | -14.34% |
| 45 | California | Natural Gas | 15.50 | 3.14% | 10.48% |
| 46 | New Hampshire | Nuclear | 16.03 | 5.20% | -0.58% |
| 47 | Massachusetts | Natural Gas | 16.86 | 9.69% | 8.83% |
| 48 | Rhode Island | Natural Gas | 17.05 | 10.46% | 11.44% |
| 49 | Connecticut | Nuclear | 17.76 | 4.07% | -5.97% |
| 50 | Alaska | Natural Gas | 17.94 | 4.61% | 13.01% |
| 51 | Hawaii | Petroleum | 26.17 | -21.60% | -2.46% |

# Electricity Prices by State, 2015

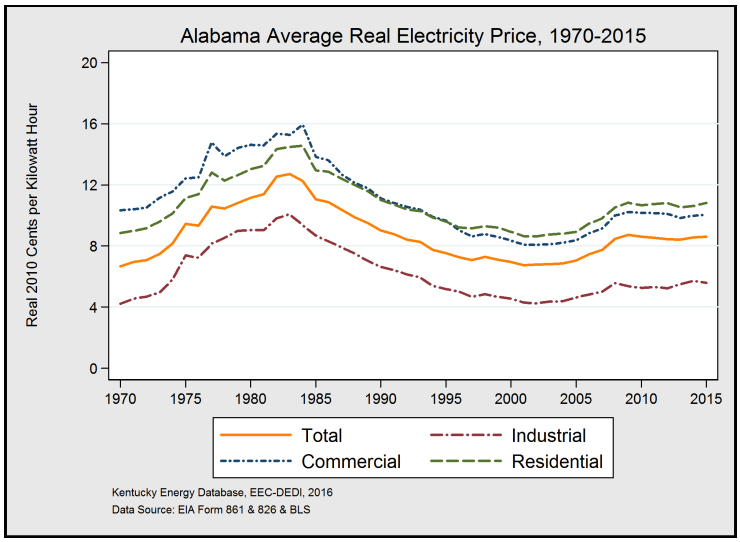


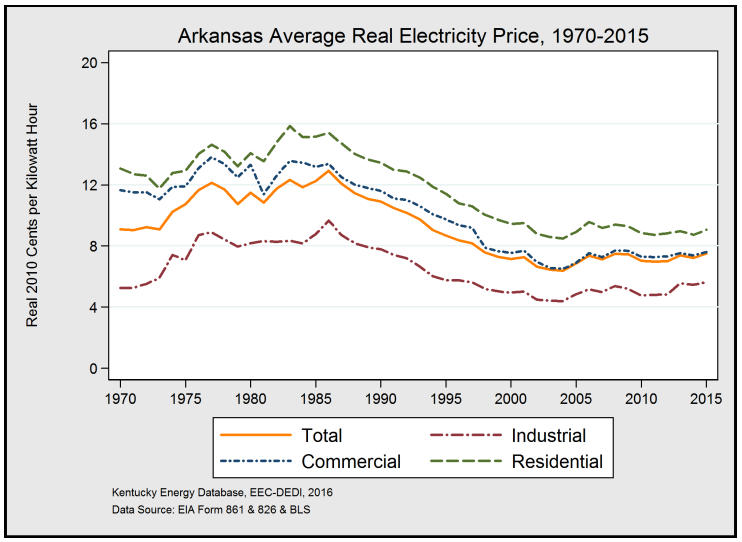

**Kentucky Energy Database, EEC-DEDI, 2016**

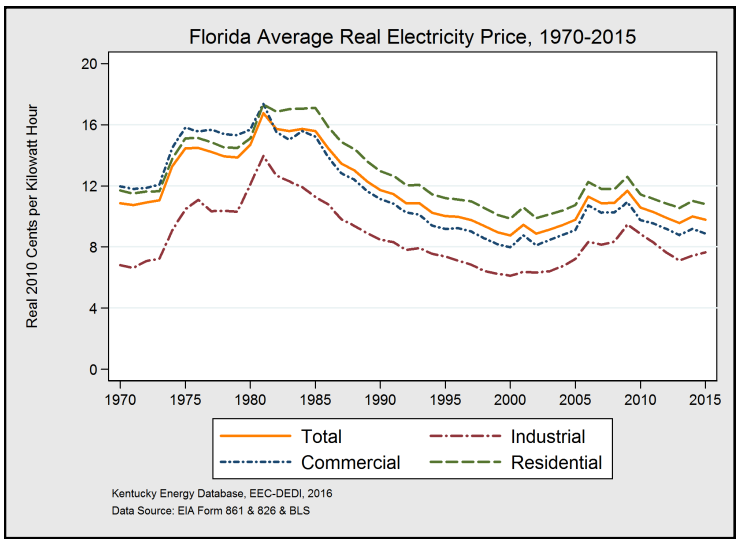
The average national electricity price is 10.4 ranging from a low of 7.41 cents per kWh in Washington state to 26.2 in Hawaii. Contrast that to the average electricity price in the SSEB states of 9.23, ranging from 7.6 in Louisiana to a high of 12.1 in Maryland. States with lower electricity prices include Louisiana and Oklahoma.

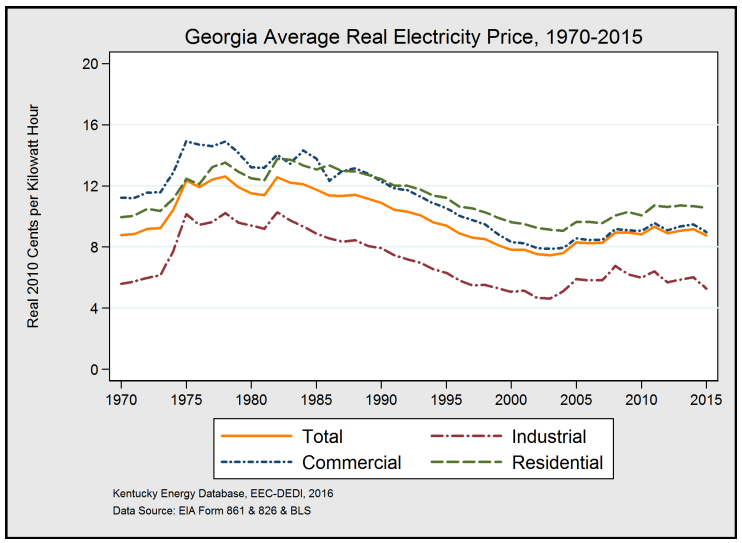
Nationally, states with low electric prices are driven by low-cost fuel resources, such as an abundance of coal and hydro-electricity, and currently, natural gas. The southern states generally enjoy lower prices with 6 states in the lower quartile and 14 states less than the national average.

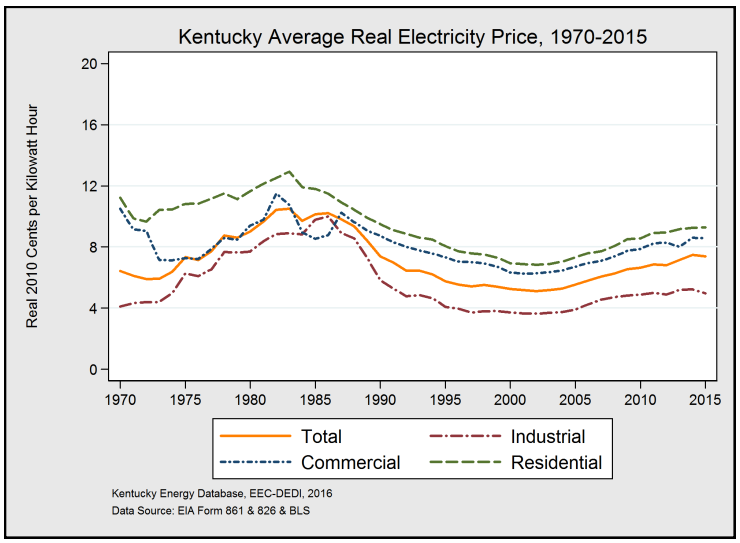
# Historical Inflation Adjusted Price of Electricity

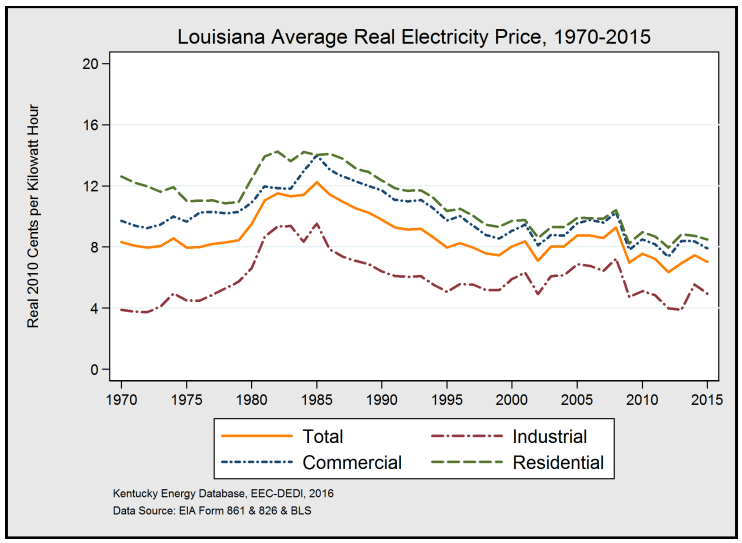


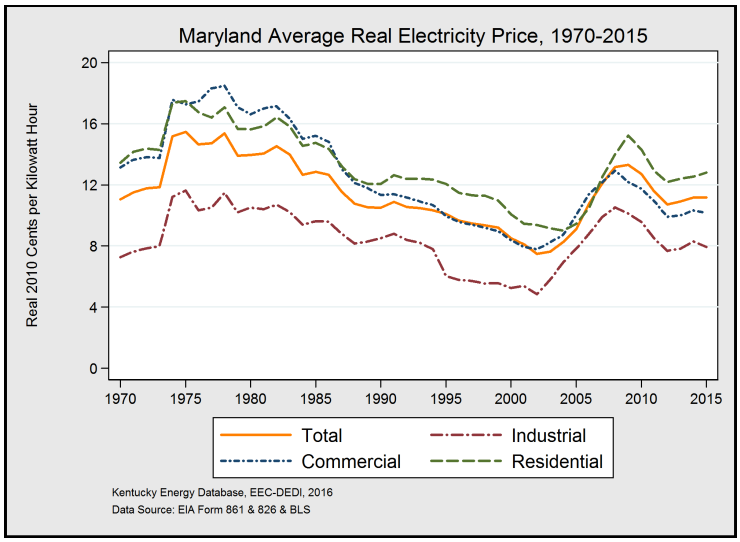



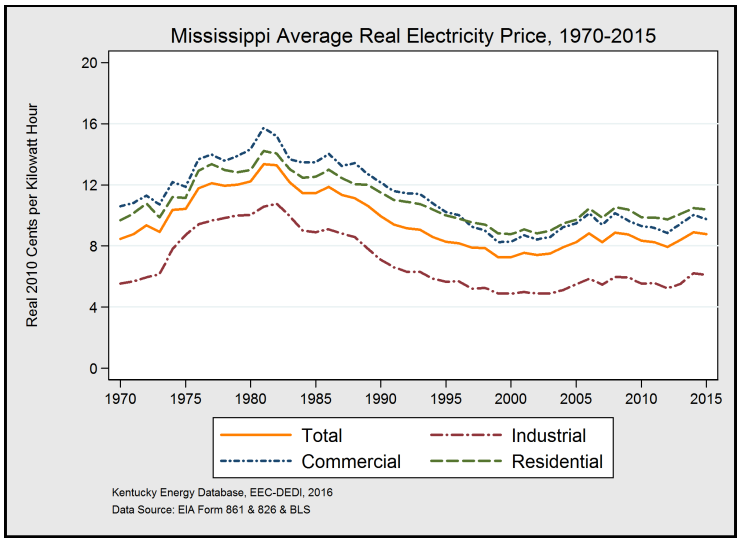



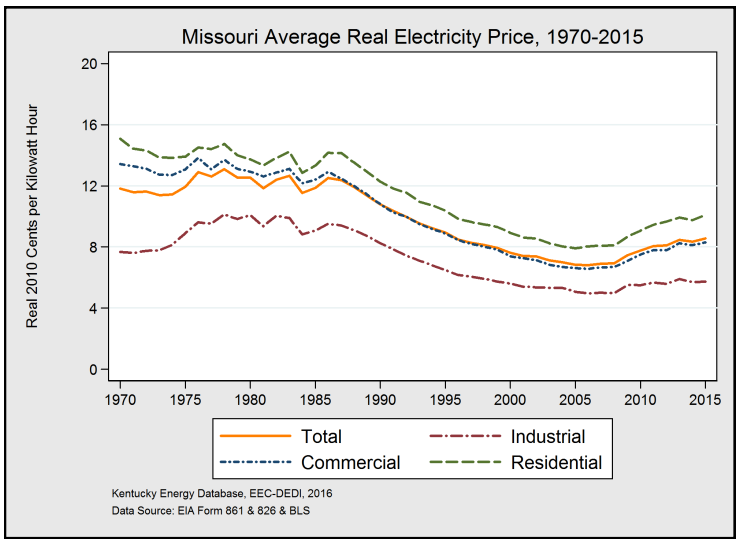



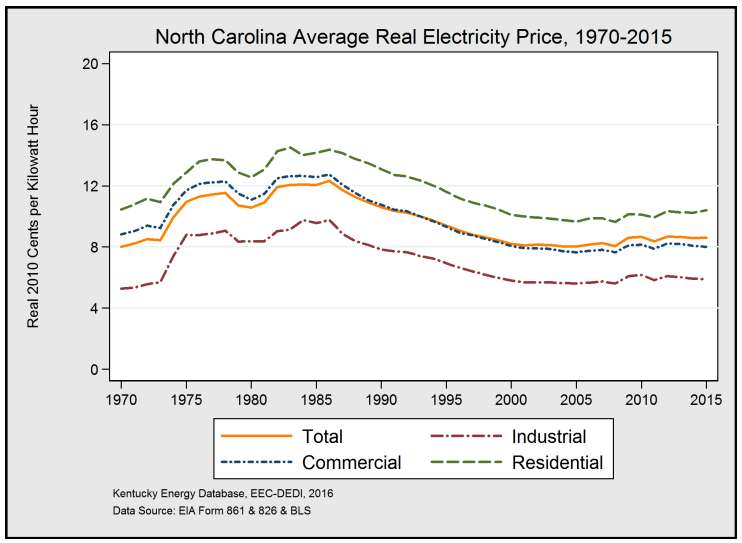



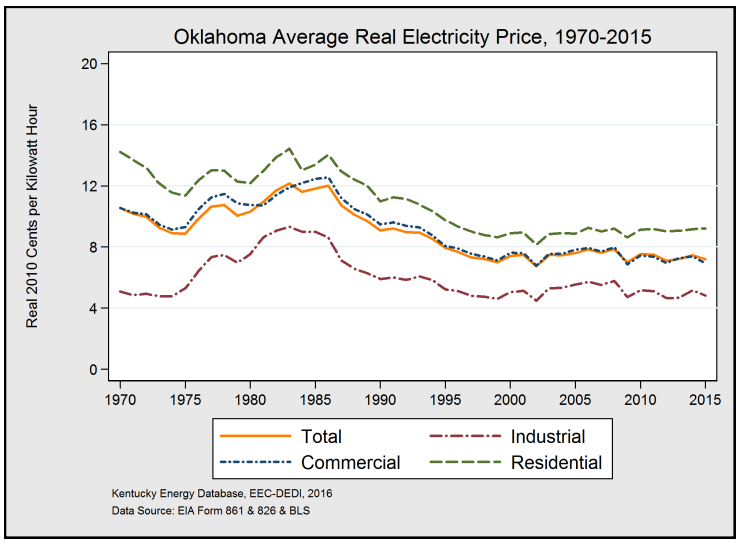
# Historical Inflation Adjusted Price of Electricity

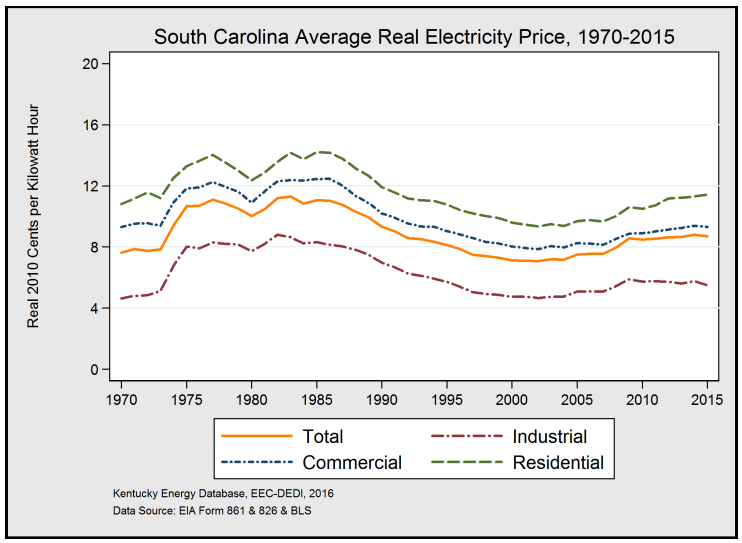


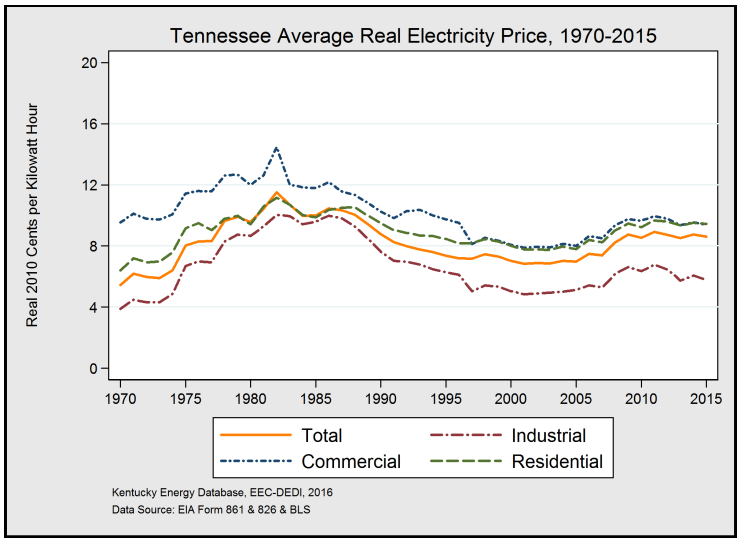



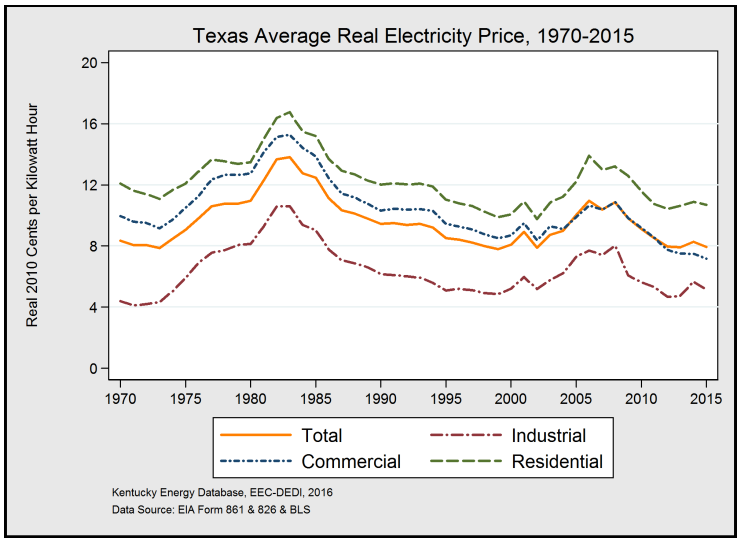



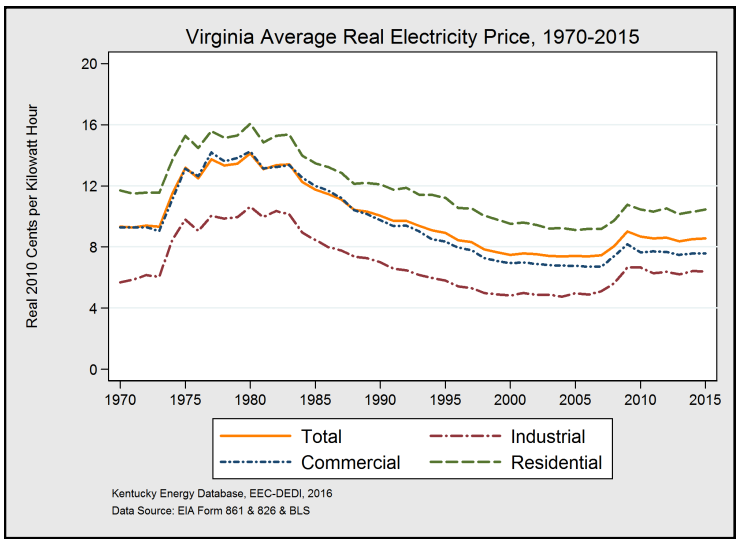



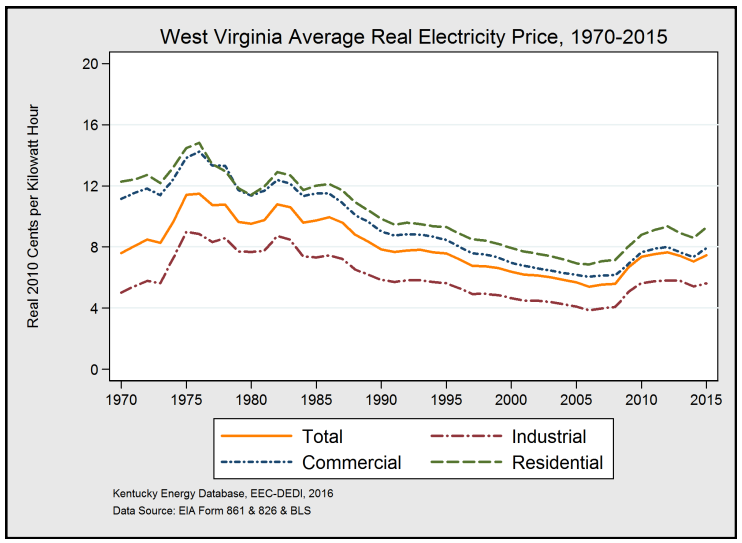



# Historical Inflation Adjusted Price of Electricity

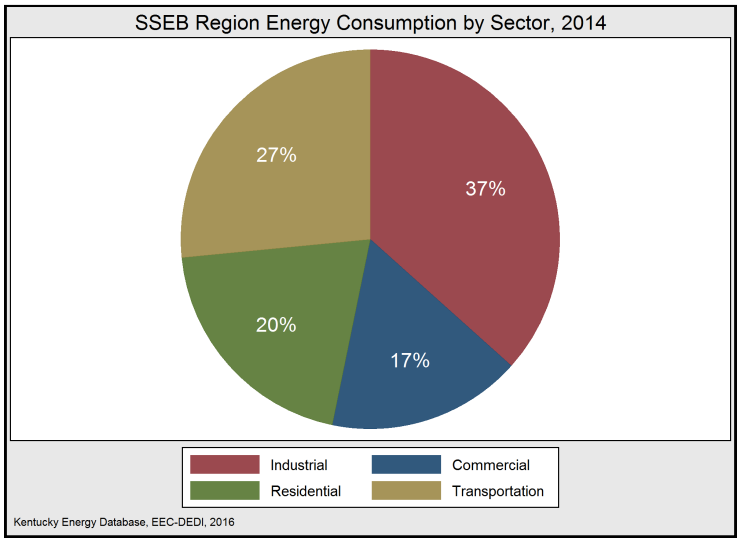


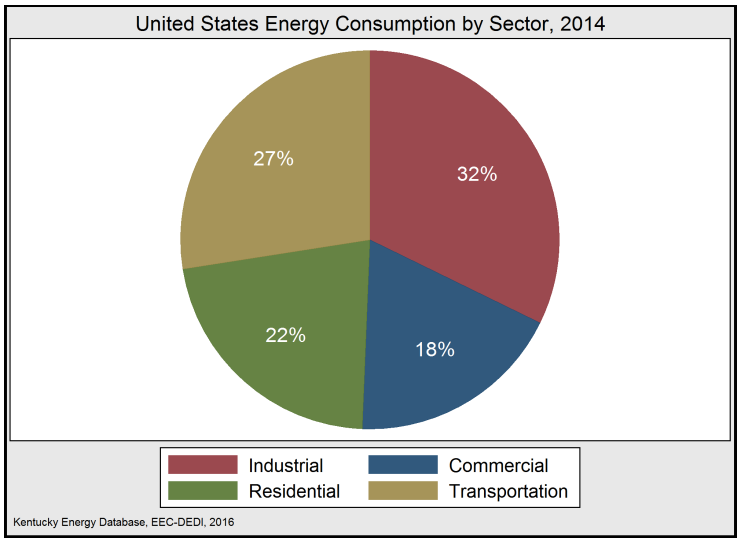



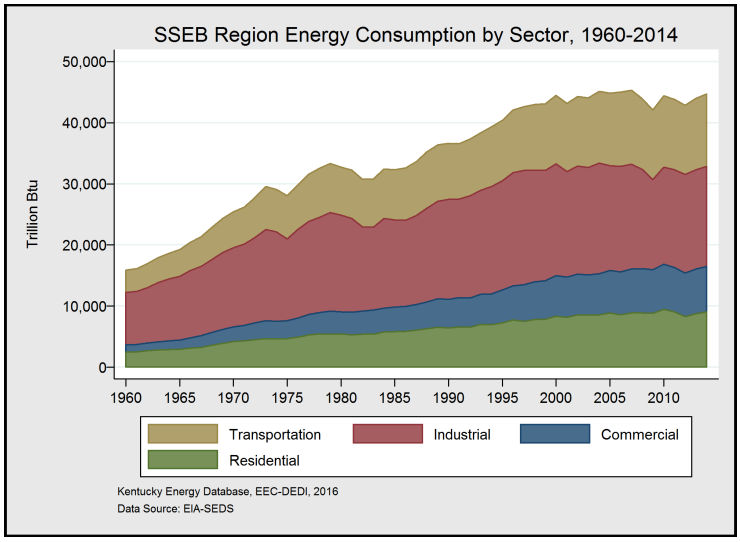
# SSEB Region Energy Consumption by Sector

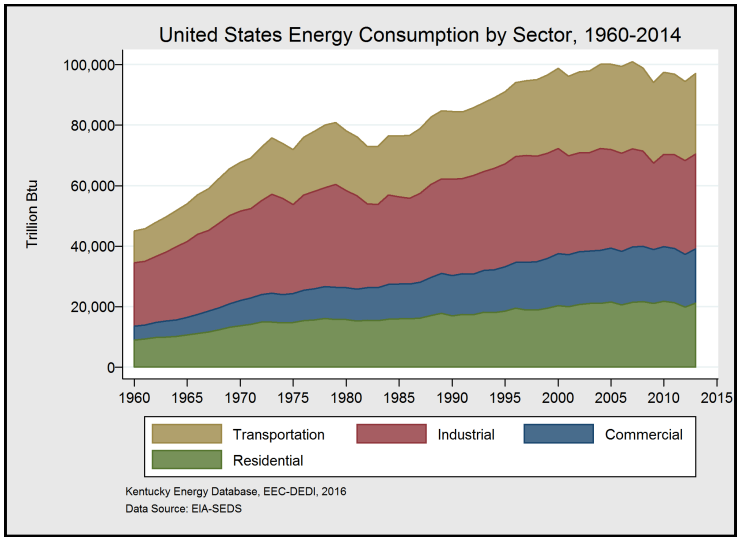



| Sector | Trillion Btu | 1 Year Change |
|---|---|---|
| Total | 44,700 | +1.5% |
| Industrial | 16,371 | +0.8% |
| Transportation | 11,857 | +1.7% |
| Residential | 9,044 | +3.3% |
| Commercial | 7,425 | +1.4% |

| Sector | Trillion Btu | 1 Year Change |
|---|---|---|
| Total | 98,400 | +1.4% |
| Industrial | 31,700 | +0.6% |
| Transportation | 27,000 | +1.1% |
| Residential | 21,500 | +1.4% |
| Commercial | 18,100 | +1.7% |

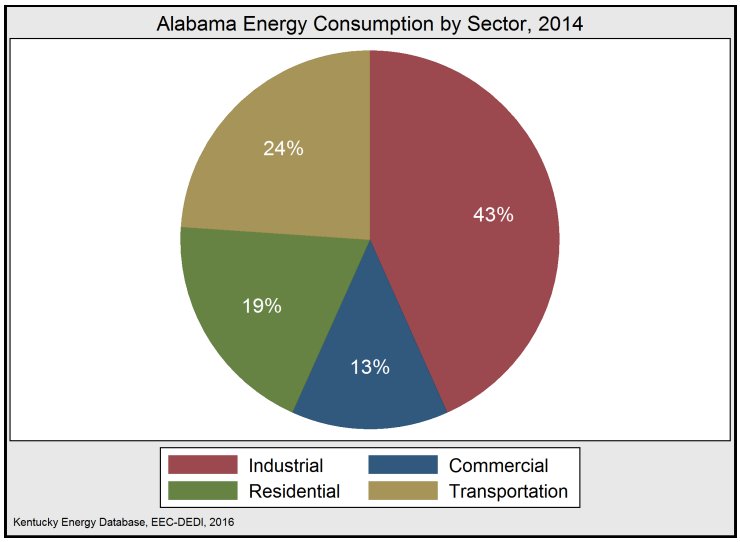


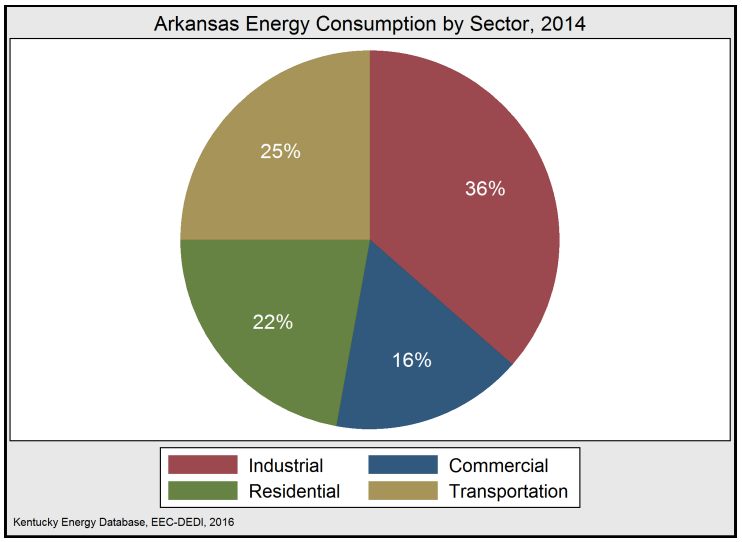



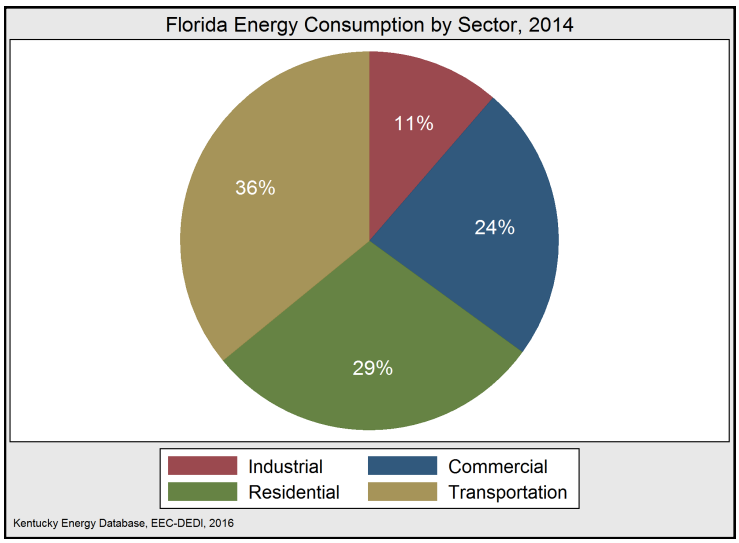

Energy consumption in the SSEB region has risen by 181 percent since 1960, with demand growth in member states averaging approximately 1.9 percent annually. The relatively energy-intensive industrial and manufacturing processes in the SSEB region continue to consume more energy than other economic sectors. Since 1960, residential and commercial energy consumption has grown at a faster rate than industrial demand.

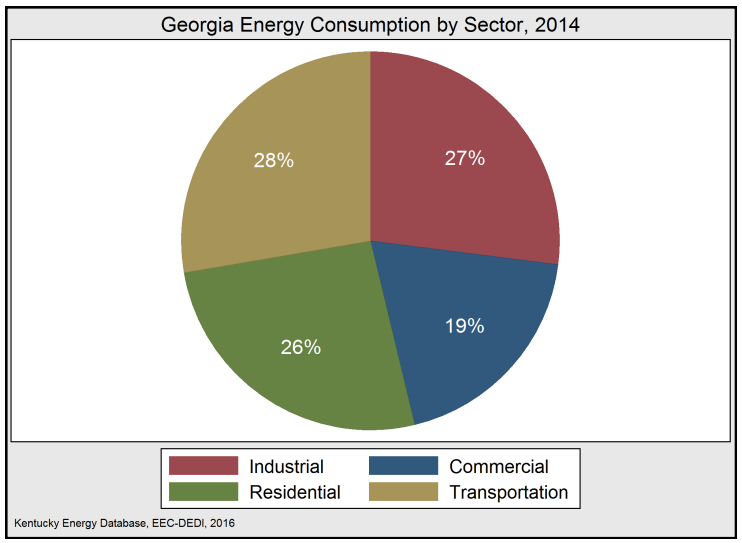
Total energy consumption in the United States increased in 2014 to 98.4 Quadrillion Btu, and by 118 percent from 1960. Although energy demand by industrial consumers nationally remains higher than other economic sectors, it is proportionally less than in the SSEB region. Energy consumption has fallen by 2.6 percent since 2007—the year of peak U.S. energy demand. This decrease in energy consumption was mostly caused by demand reduction in the transportation and industrial sectors.

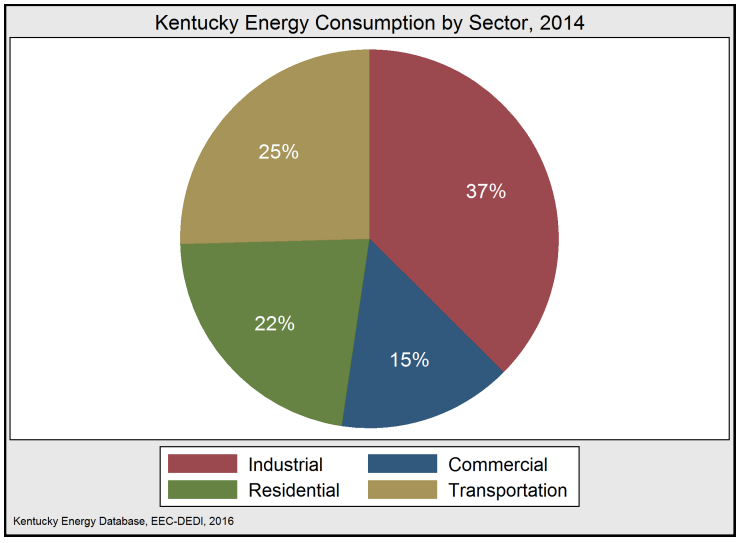
# Energy Consumption by Sector

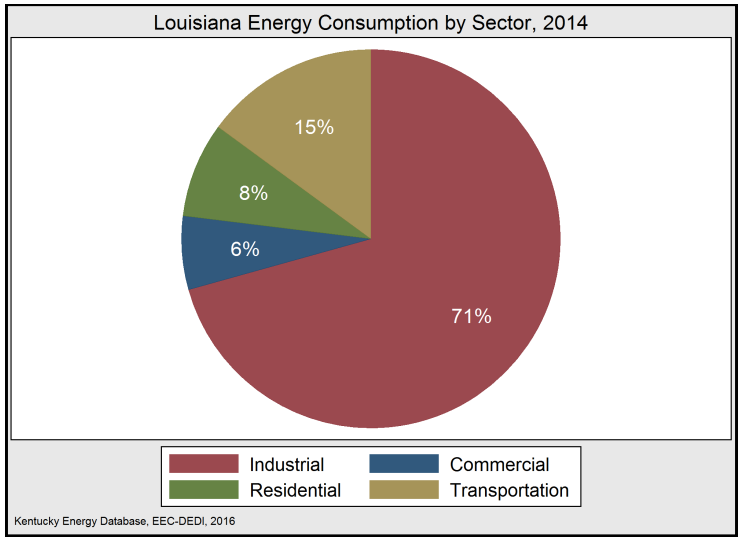


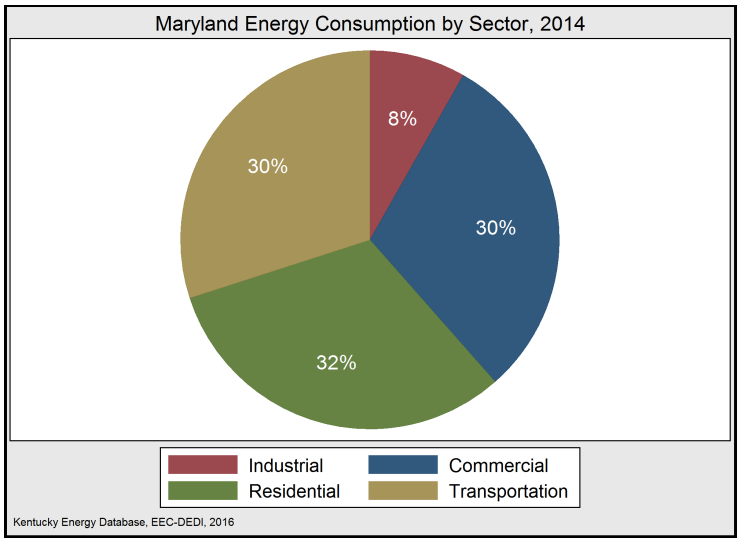



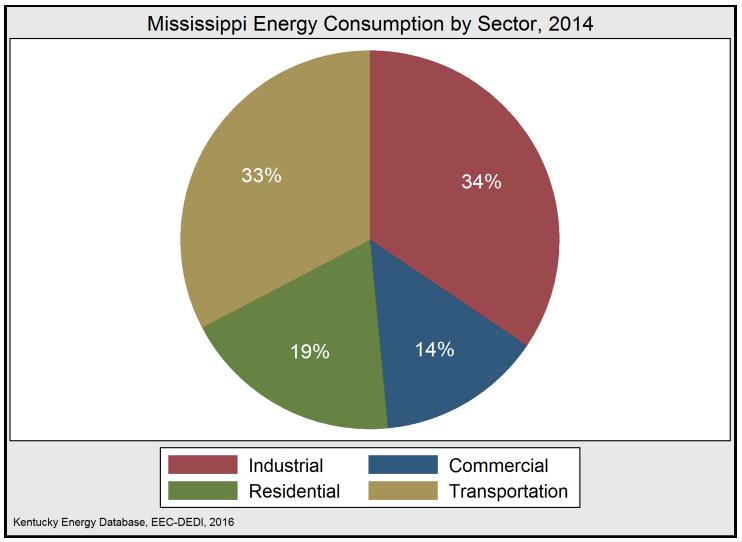



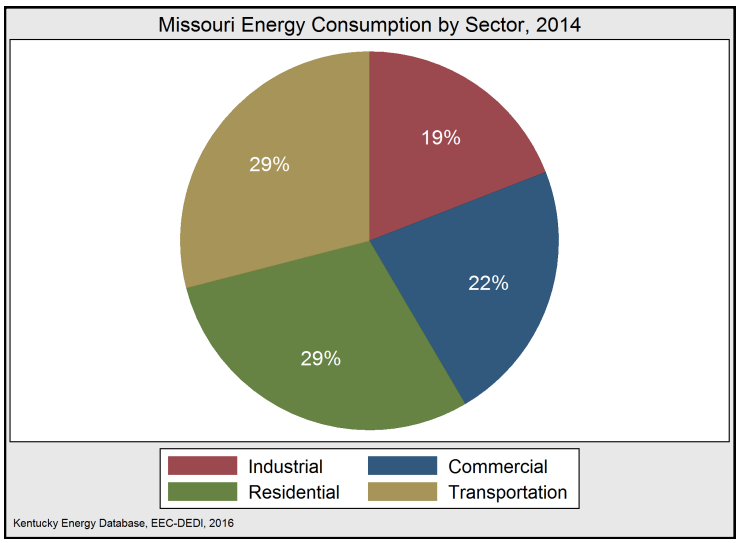



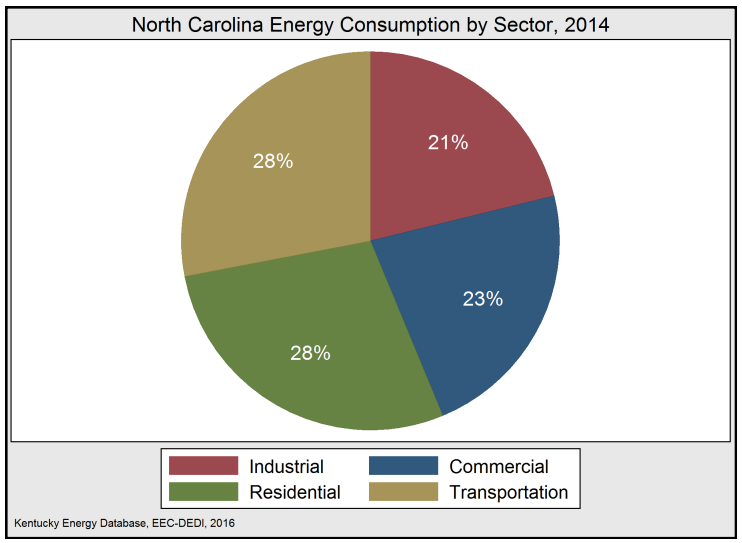



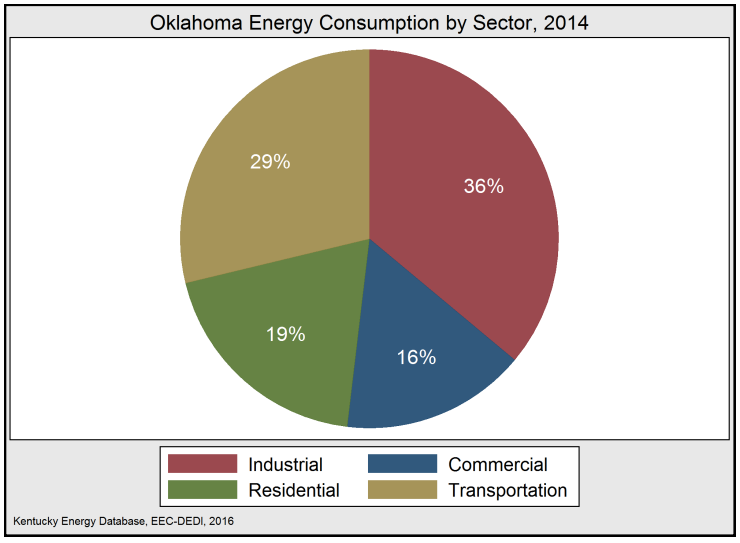
# Energy Consumption by Sector

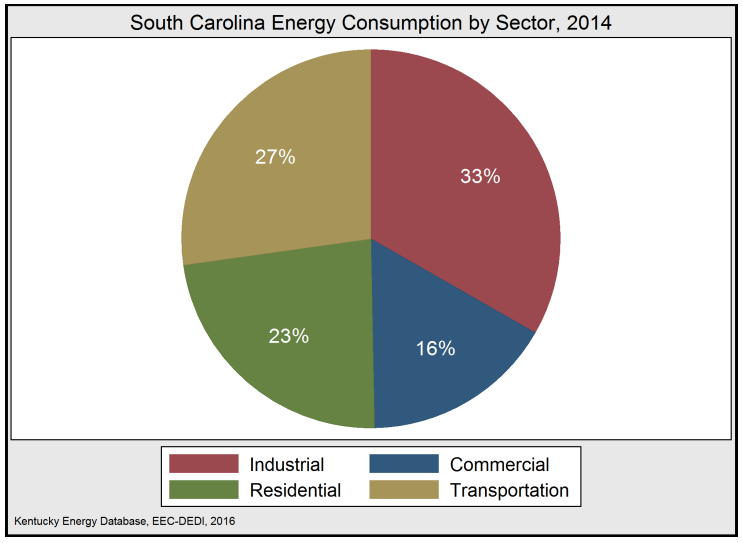


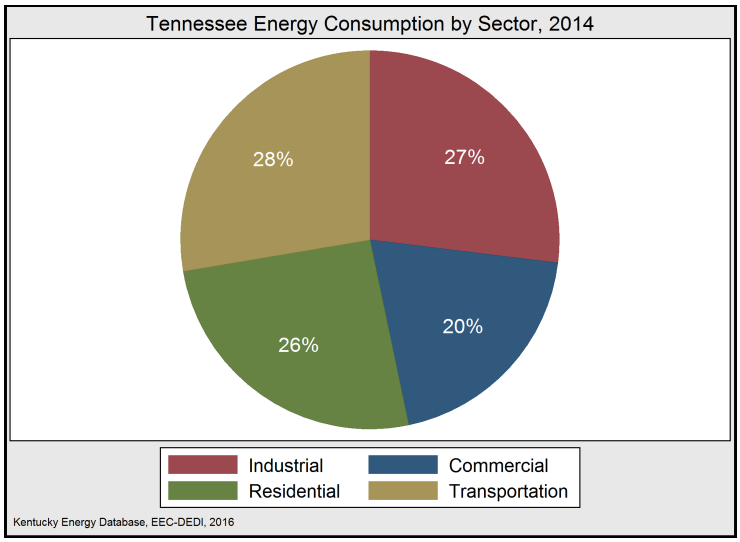



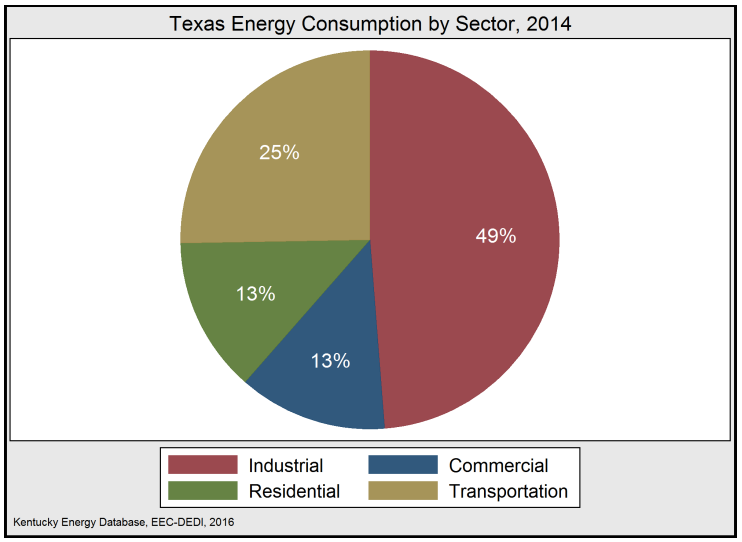



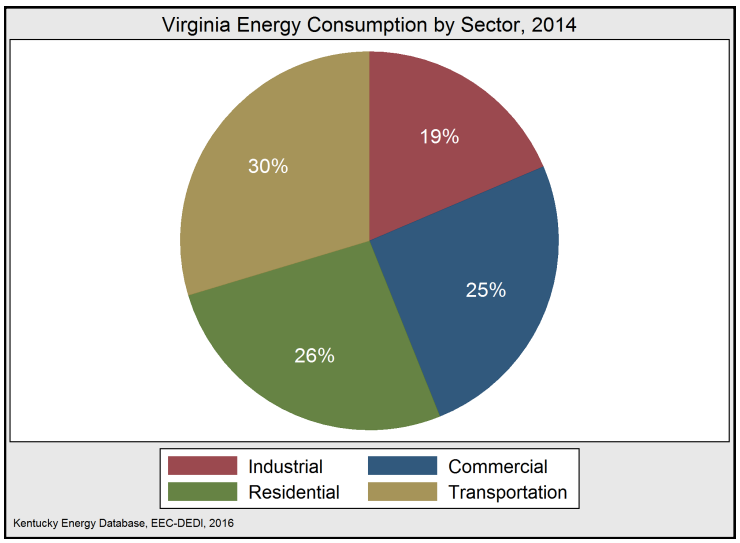



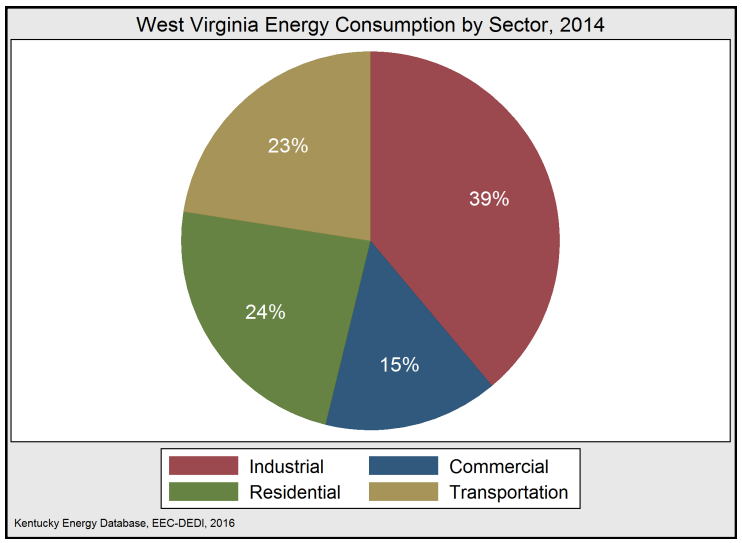



# Energy Consumption by Sector

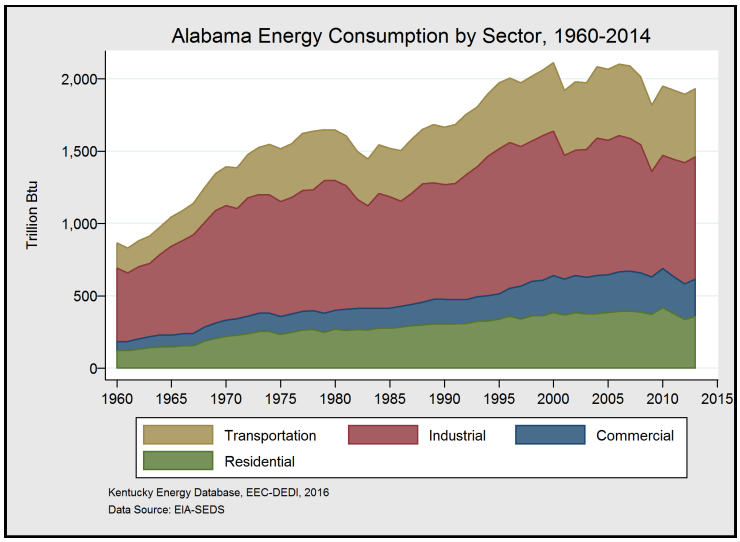


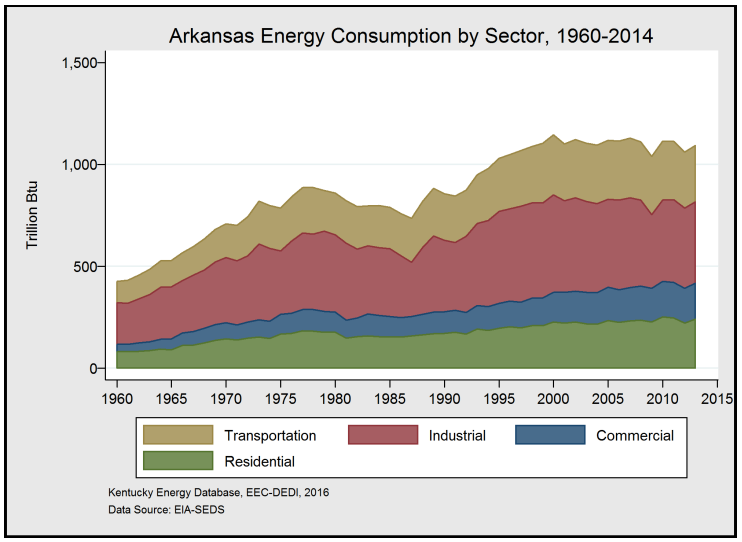



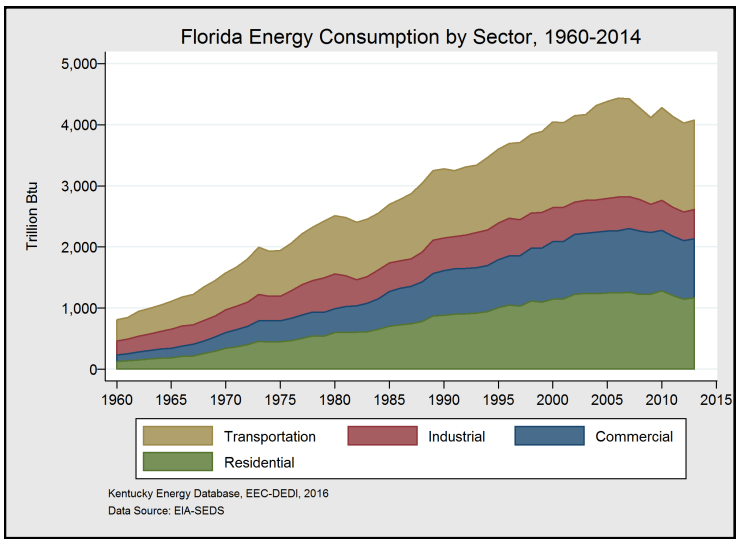



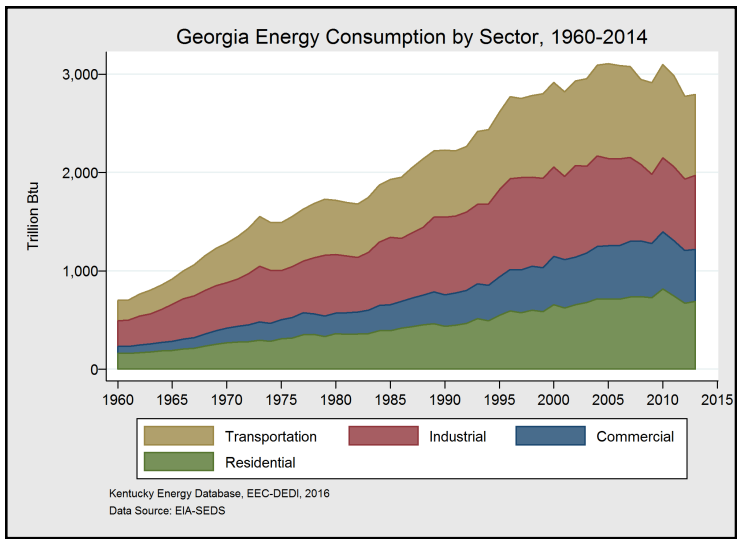



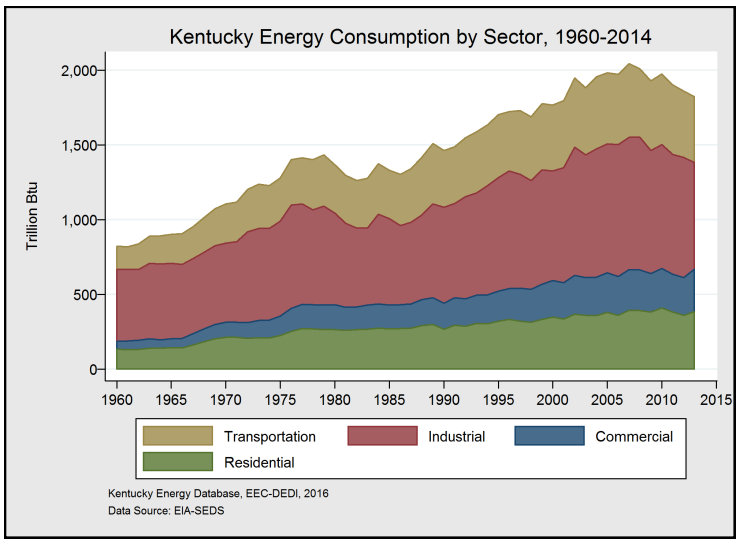
# Historical Energy Consumption by Sector

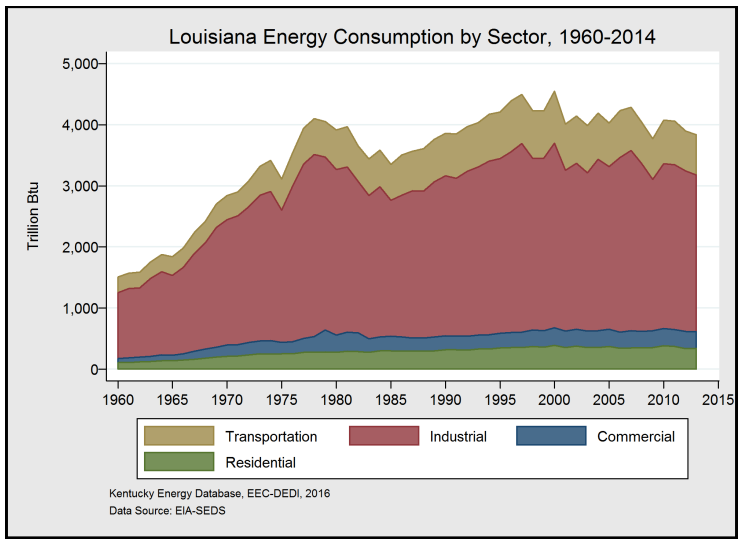


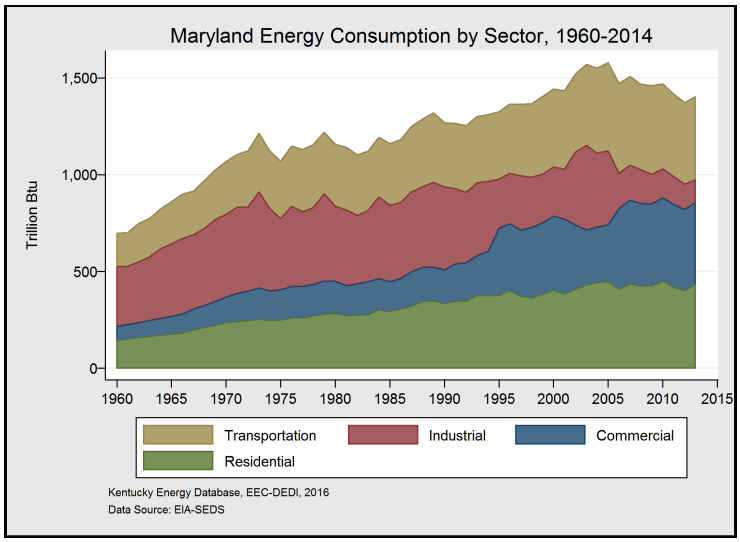



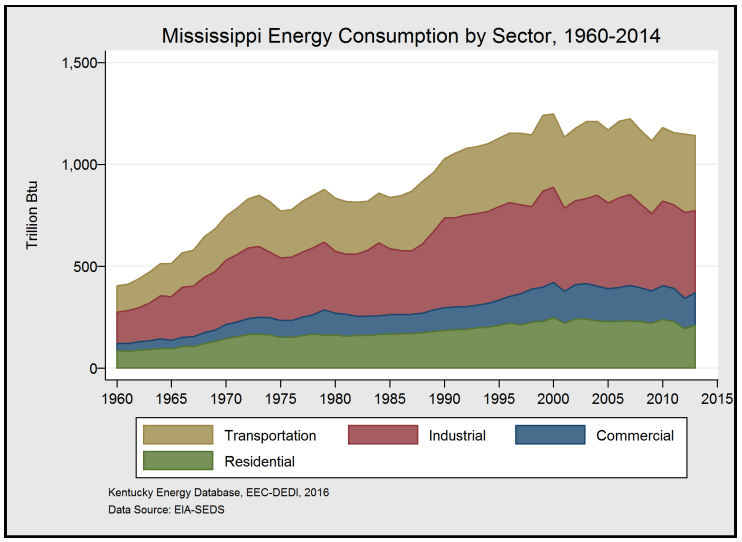



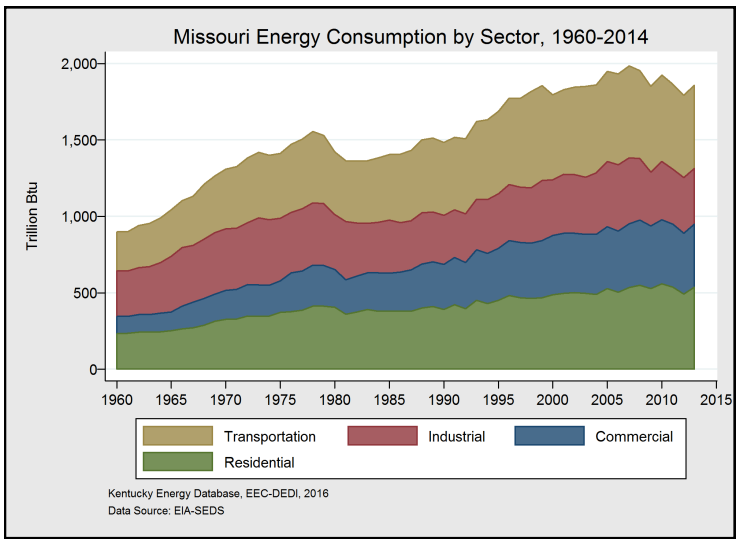



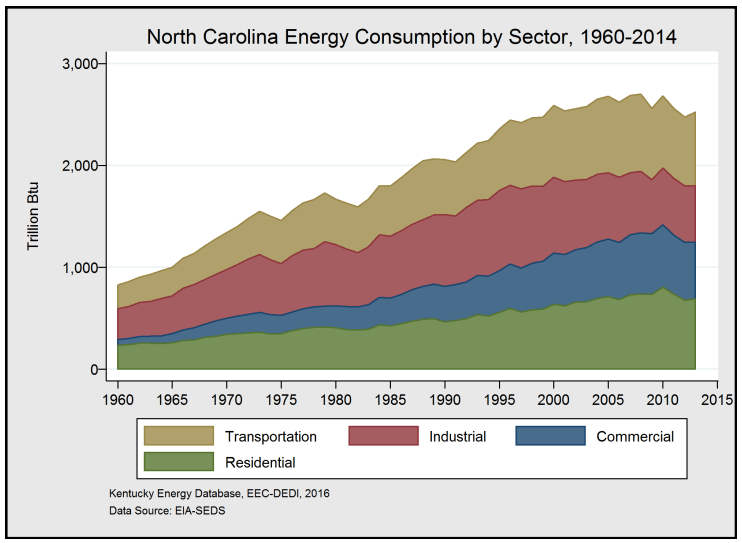



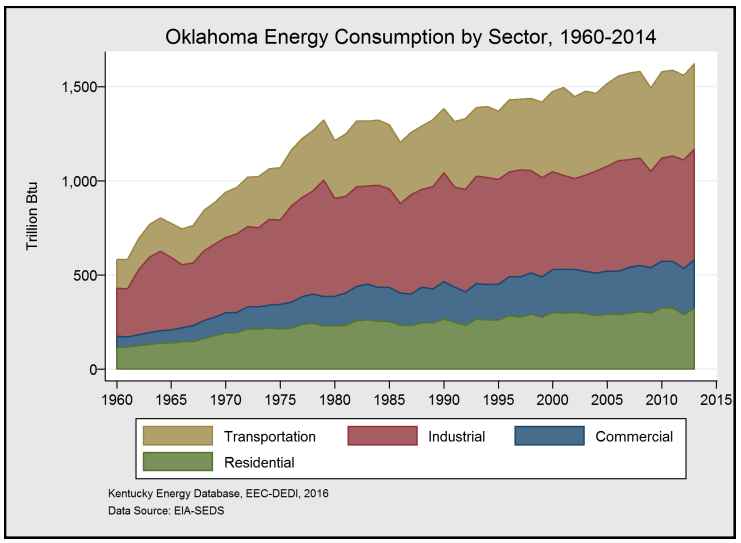
# Historical Energy Consumption by Sector

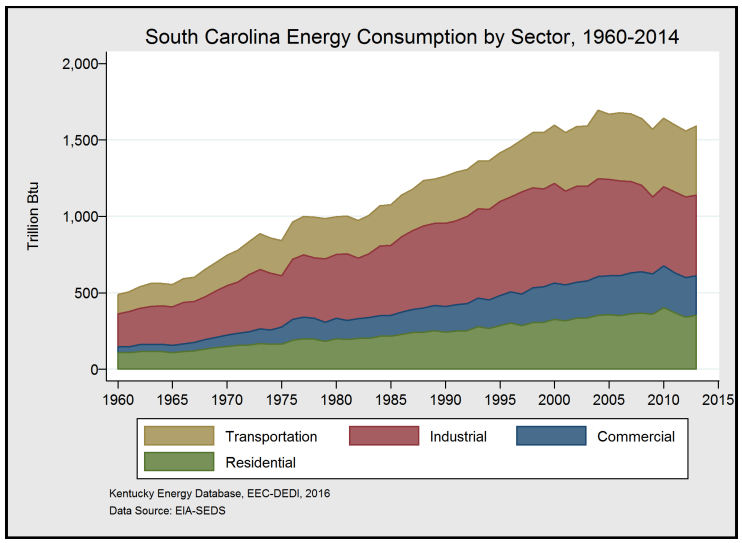


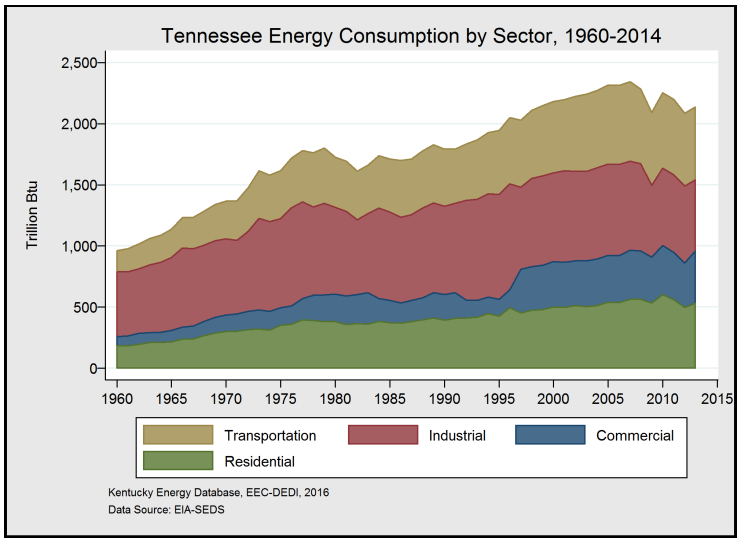



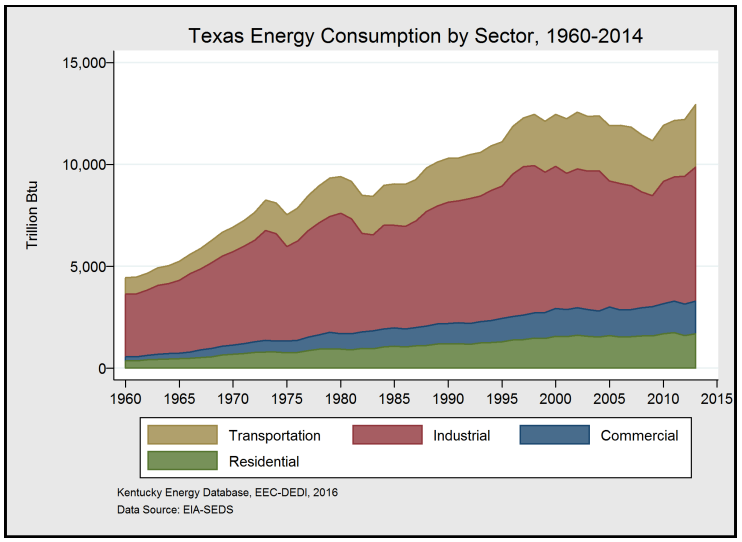



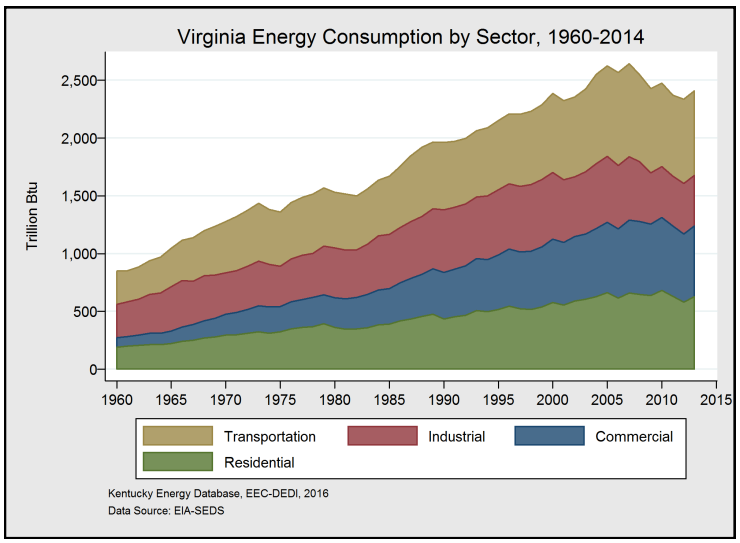



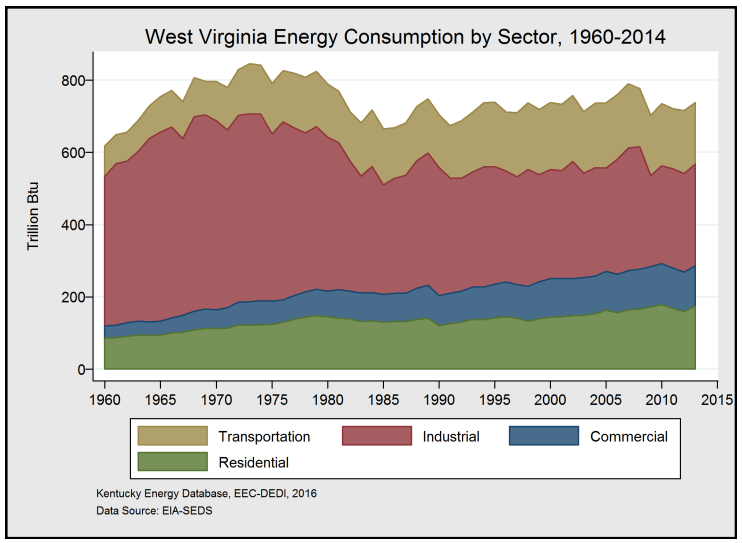



# Historical Energy Consumption by Sector

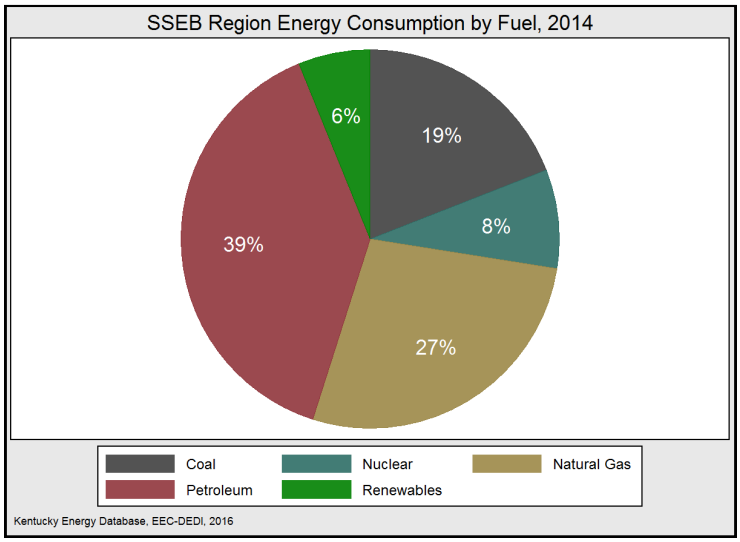


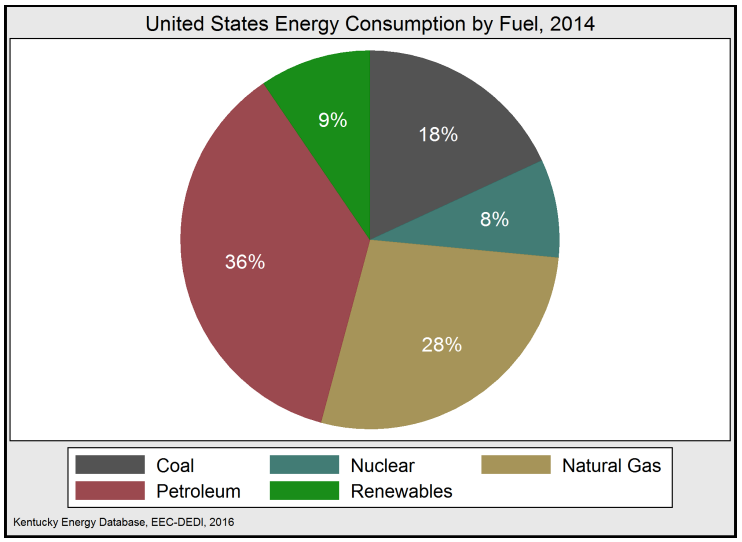



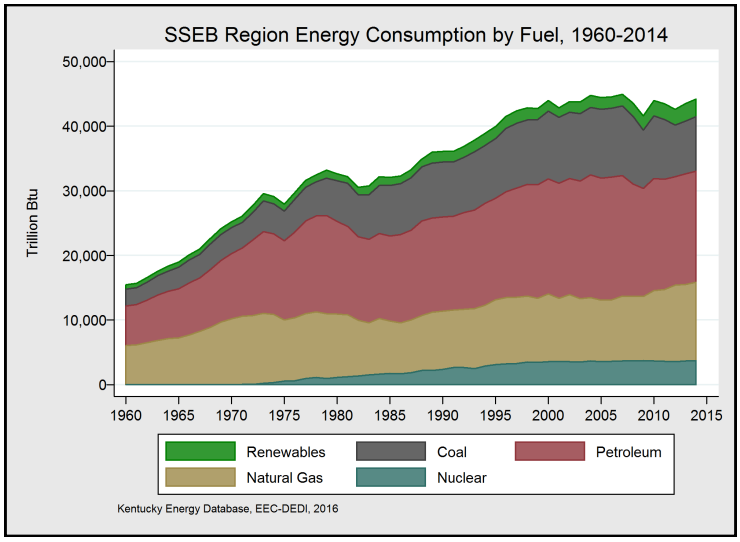
# SSEB Region Energy Consumption by Source

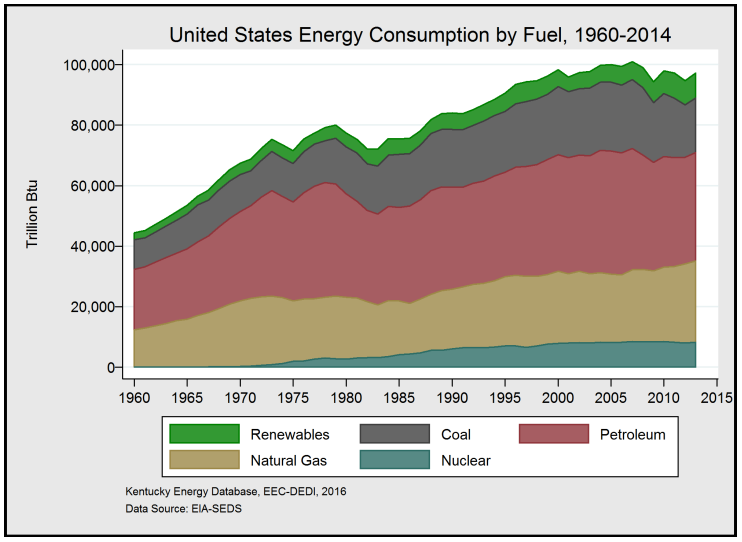



| Source Type | Trillion Btu | 1 Year Change |
|---|---|---|
| Total | 44,700 | +1.5% |
| Petroleum | 17,203 | +0.6% |
| Natural Gas | 12,116 | +2.4% |
| Coal | 8,429 | +2.8% |
| Nuclear | 3,743 | +1.4% |
| Renewables | 2,730 | +0.2% |

| Source Type | Trillion Btu | 1 Year Change |
|---|---|---|
| Total | 98,400 | +1.3% |
| Petroleum | 36,100 | +0.8% |
| Natural Gas | 27,500 | +2.2% |
| Coal | 18,000 | ~0.0% |
| Renewables | 8,564 | +3.1% |
| Nuclear | 8,338 | +1.1% |

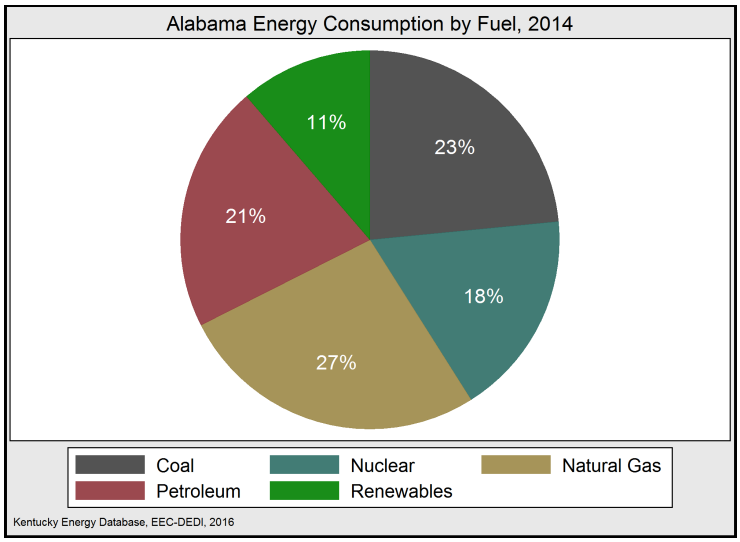


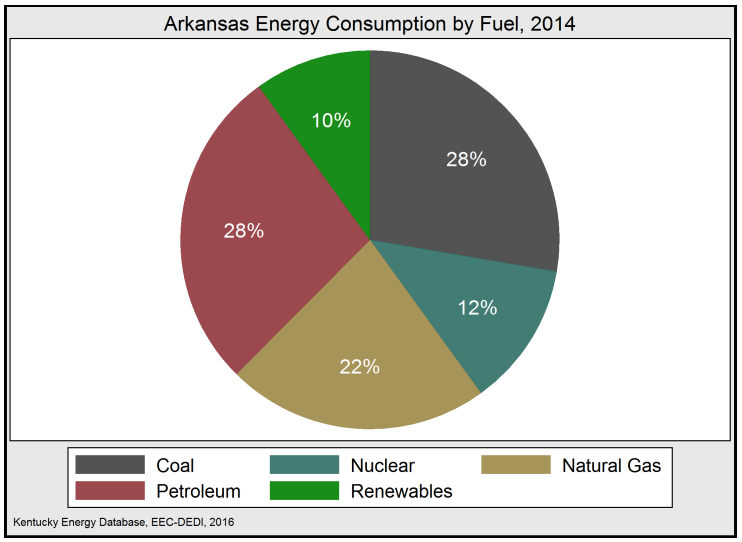



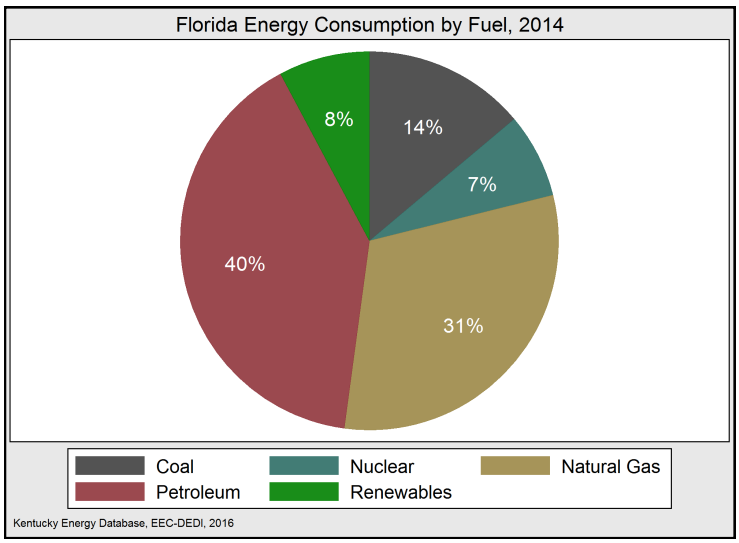

Total energy consumption in the SSEB region has risen by 181 percent from 1960 to almost 45 Quadrillion Btu in 2014, but the growth rate of energy demand has declined steadily since the late 1990s. Total energy demand has decreased by 1.4 percent since peaking in 2007; however regional demand remains 45 percent of all energy consumption nationally. Renewable resources have risen to 6 percent of all energy consumed in the SSEB region in 2014, led by increased wind electricity generation.

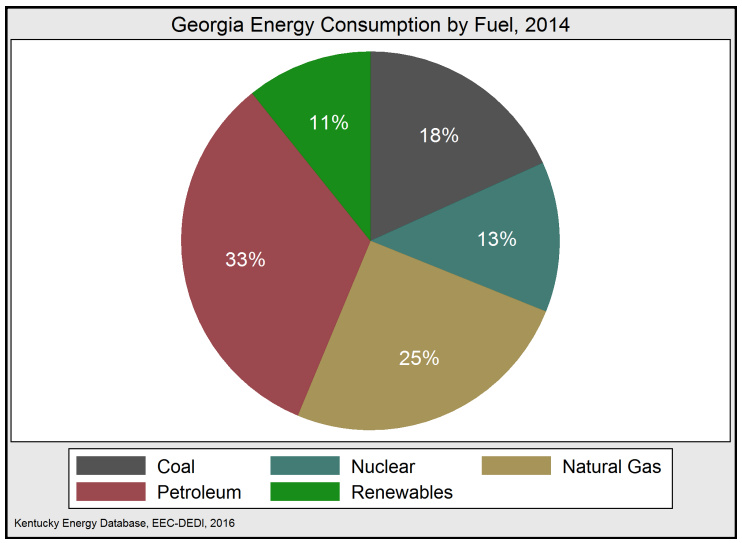
Energy consumption in the United States increased by 118 percent from 1960 to nearly 98.4 Quadrillion Btu in 2014, although it has fallen by 6.2 percent since 2007. The use of petroleum products continues to be the primary energy resource in both the SSEB region and the United States as a whole at 39 and 36 percent respectively in 2014, and is used primarily for transportation. Renewable energy now accounts for 9 percent of all energy consumed nationally.

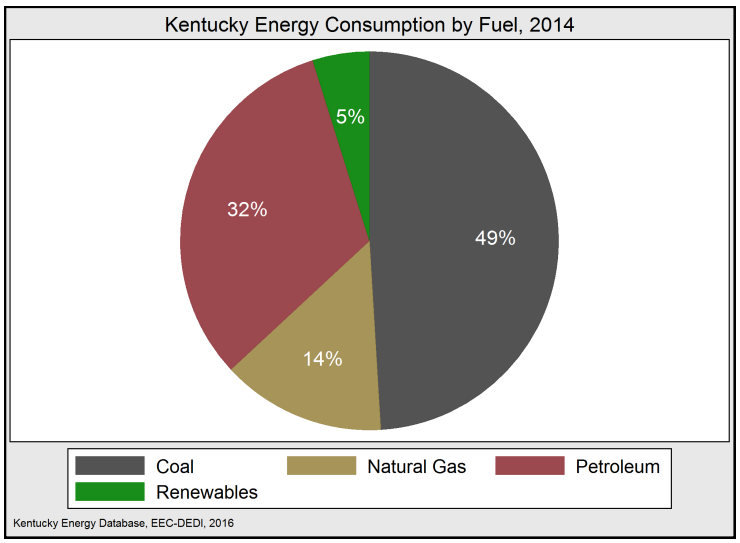
# Energy Consumption by Source

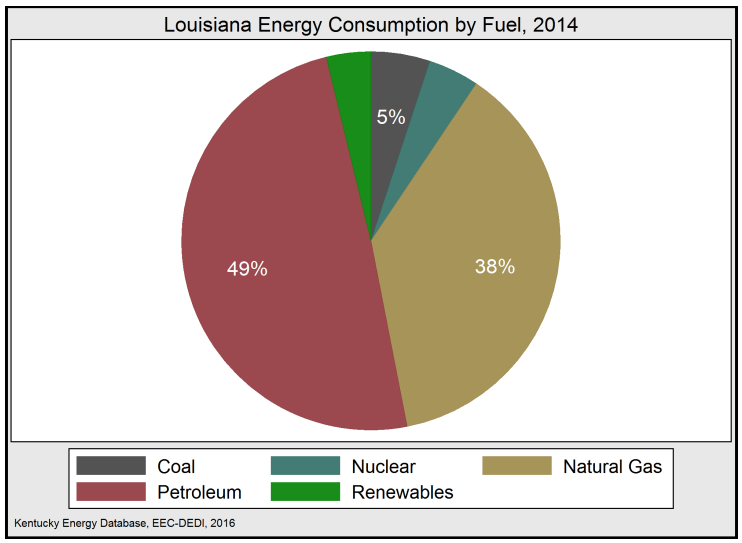


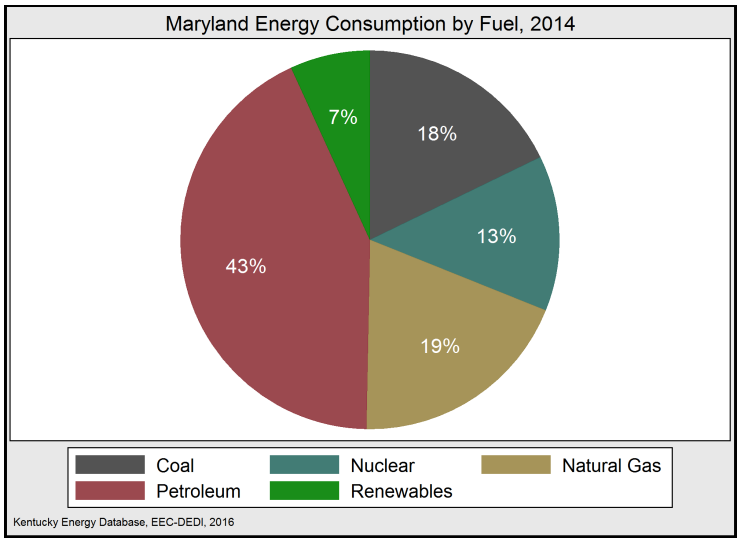



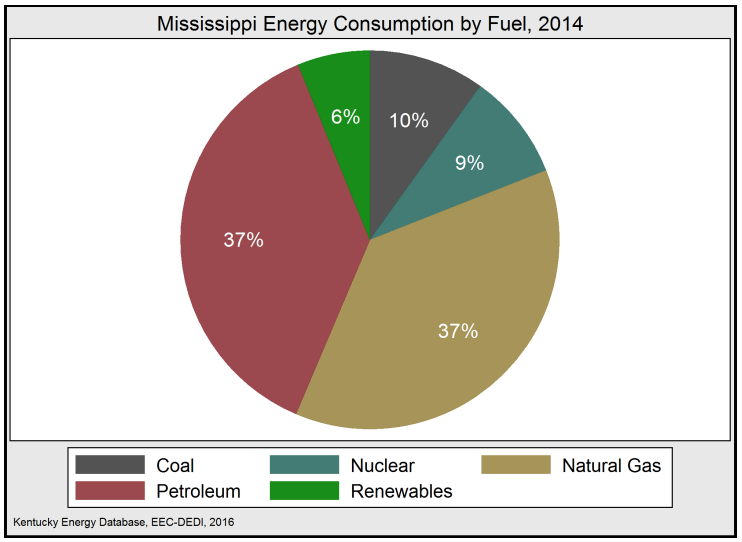



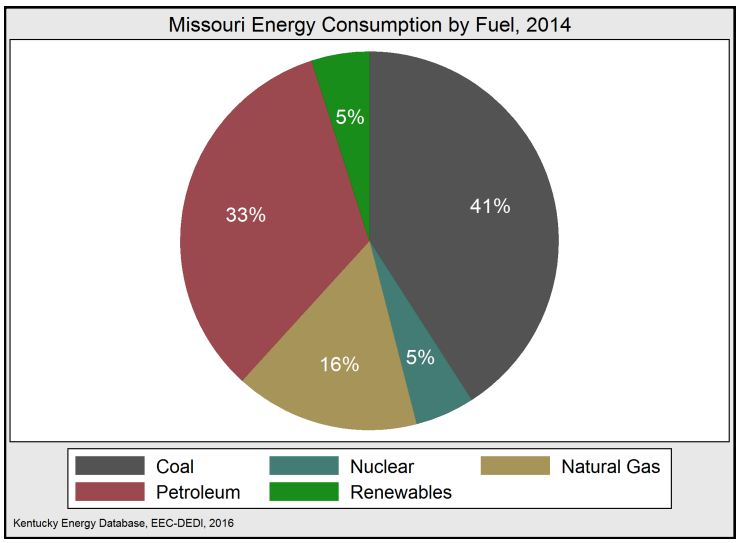



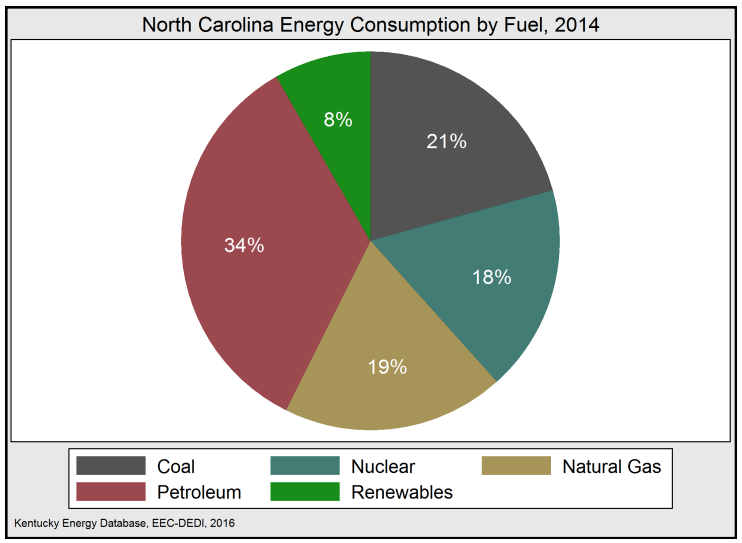



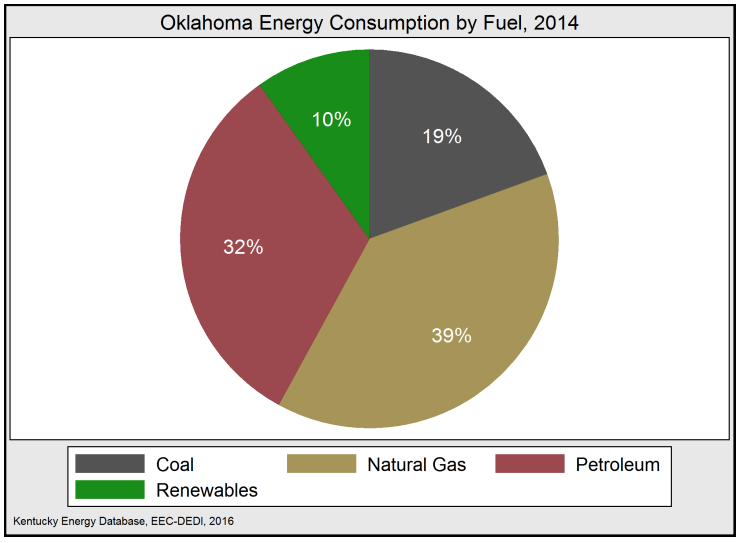
# Energy Consumption by Source

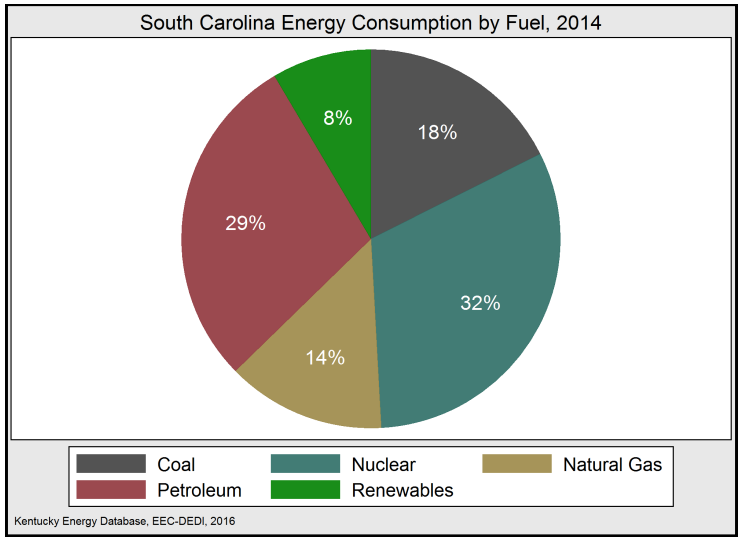


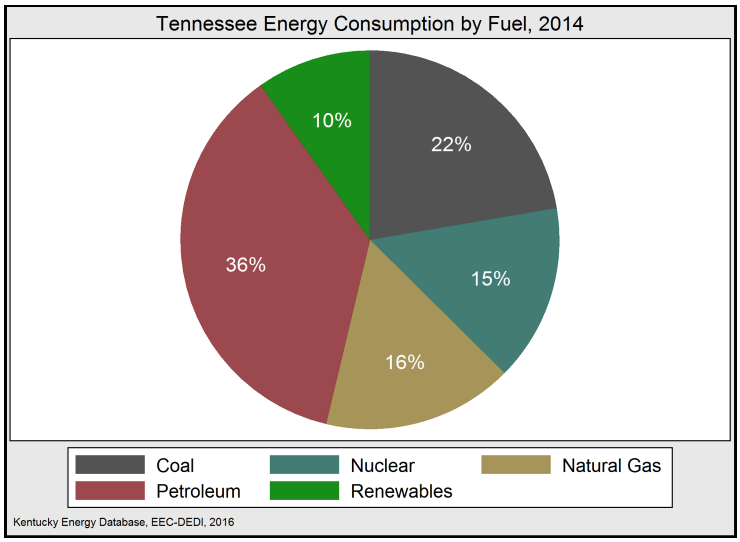



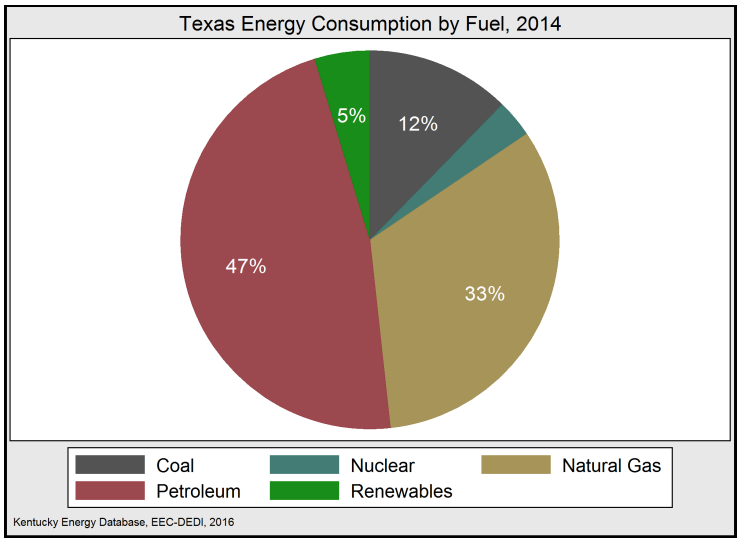



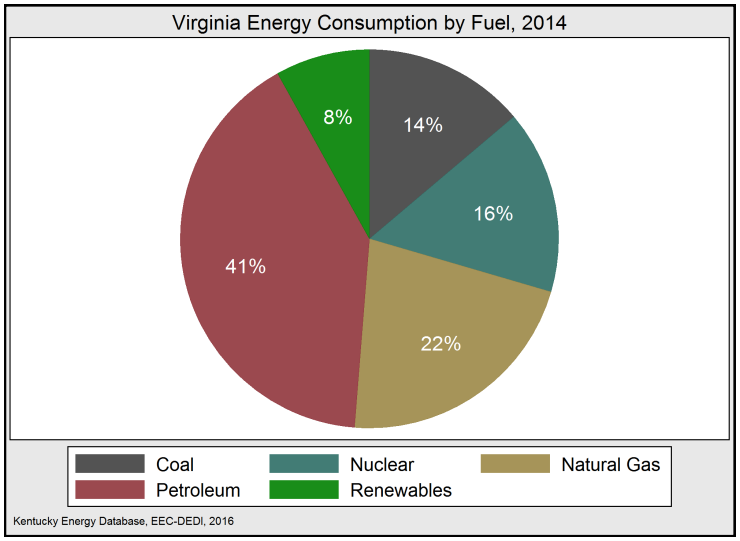



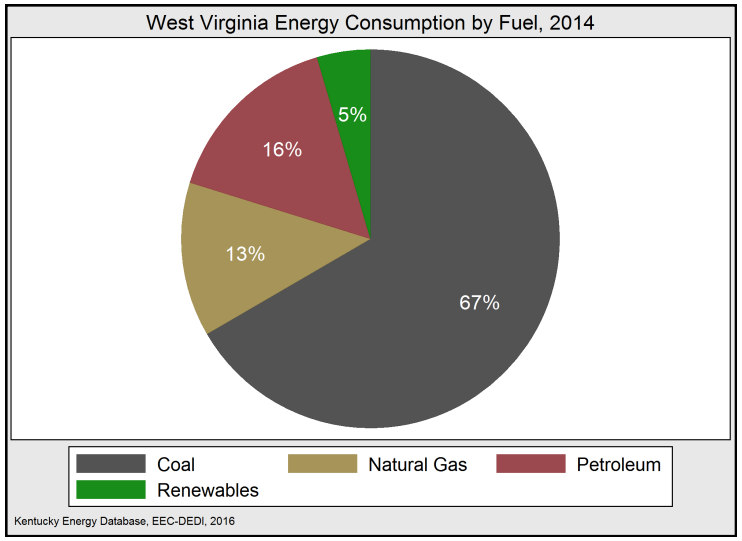



# Energy Consumption by Source

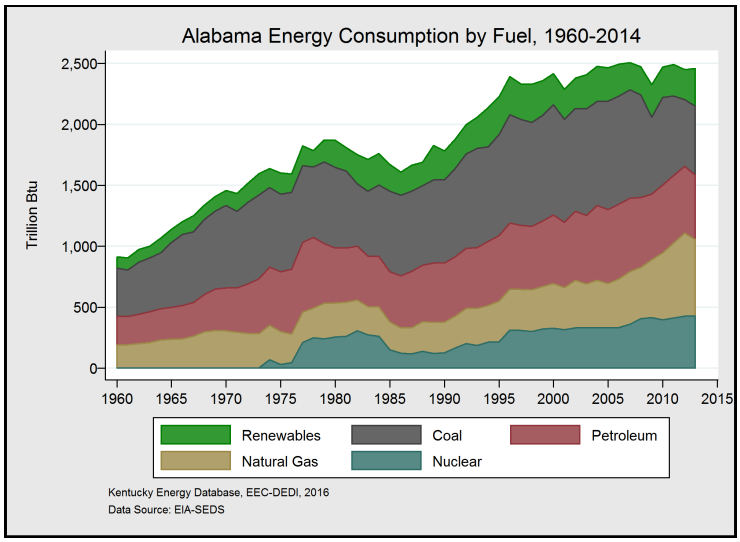


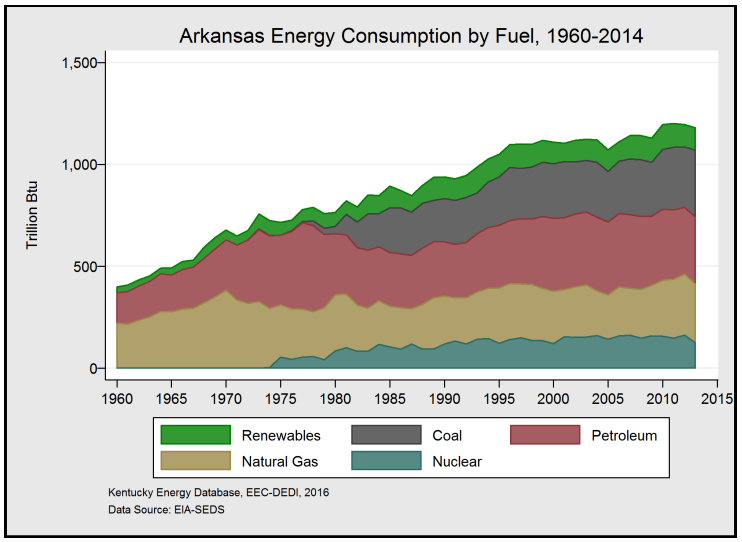



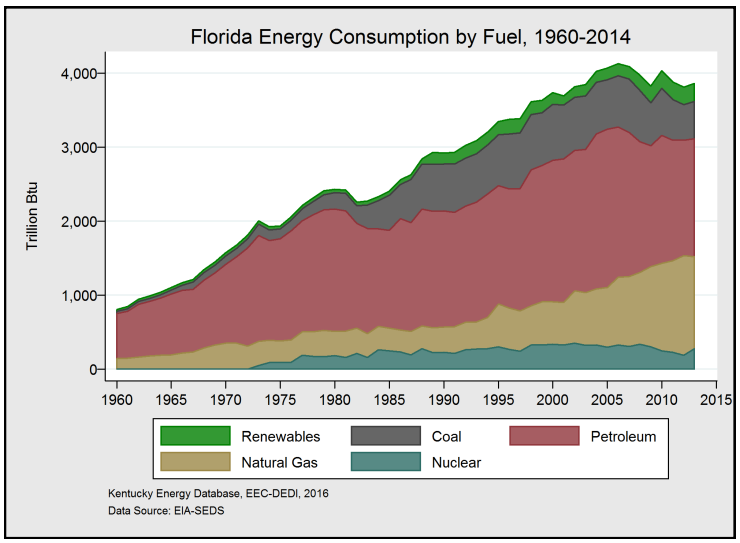



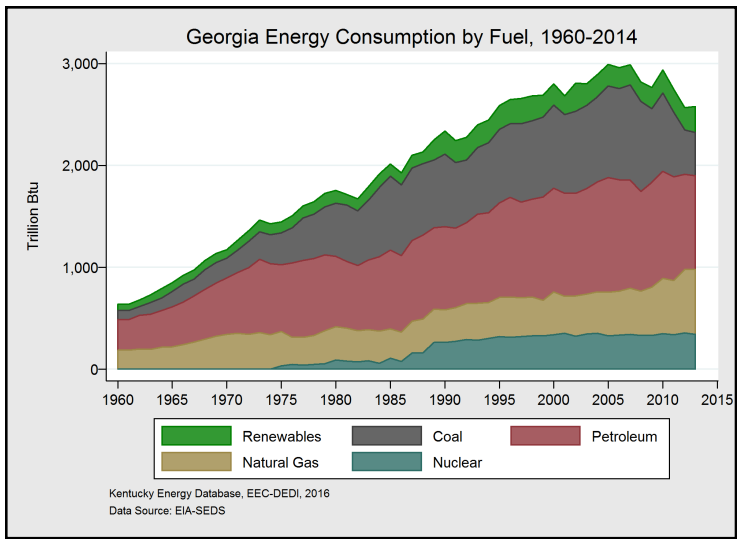



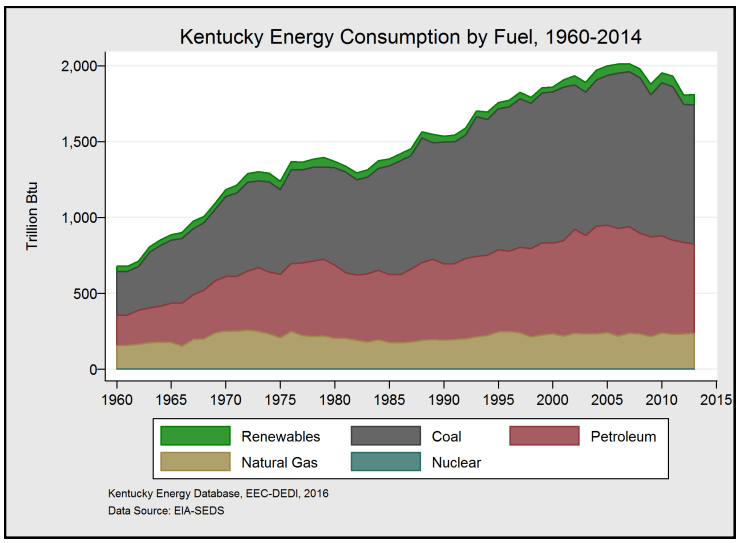
# Historical Energy Consumption by Source

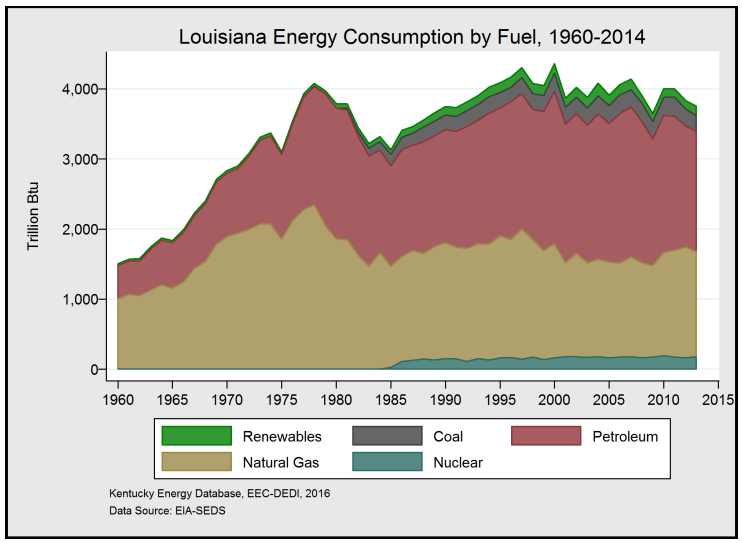


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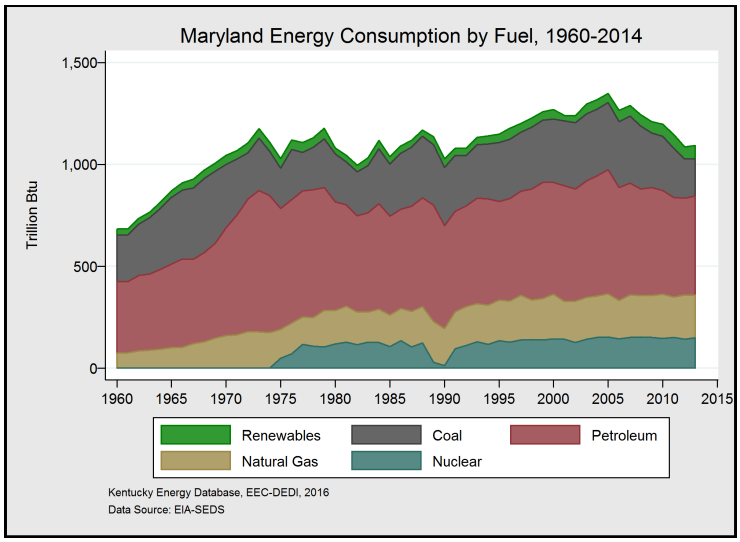
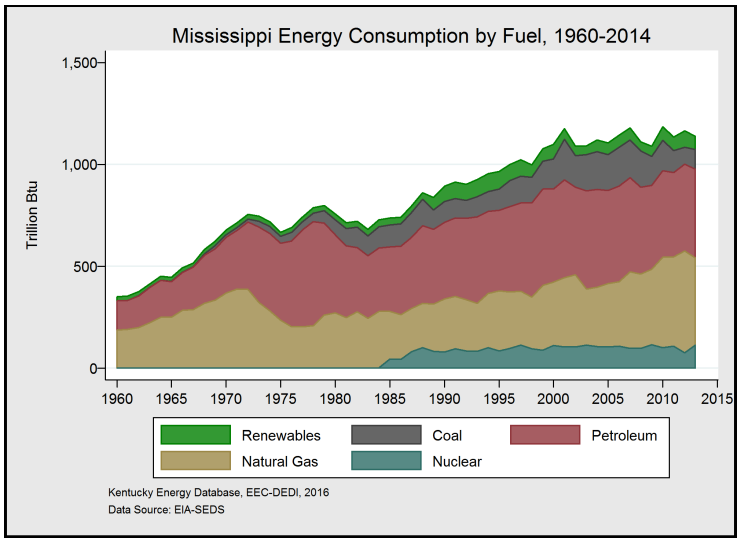
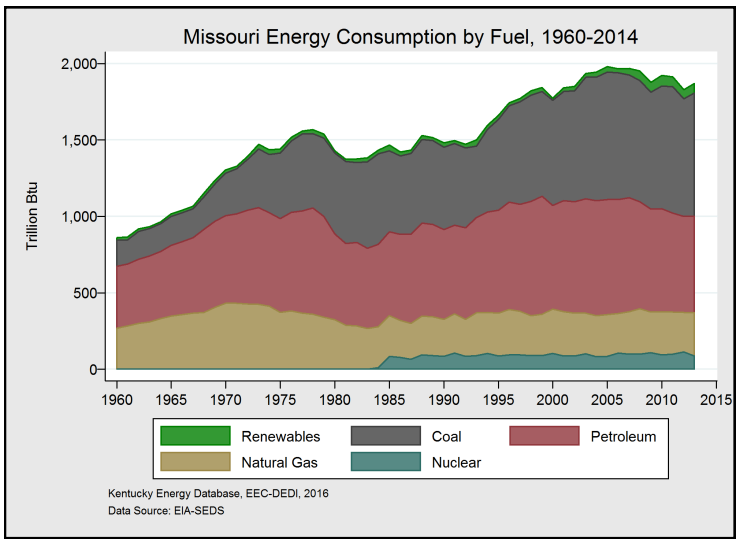
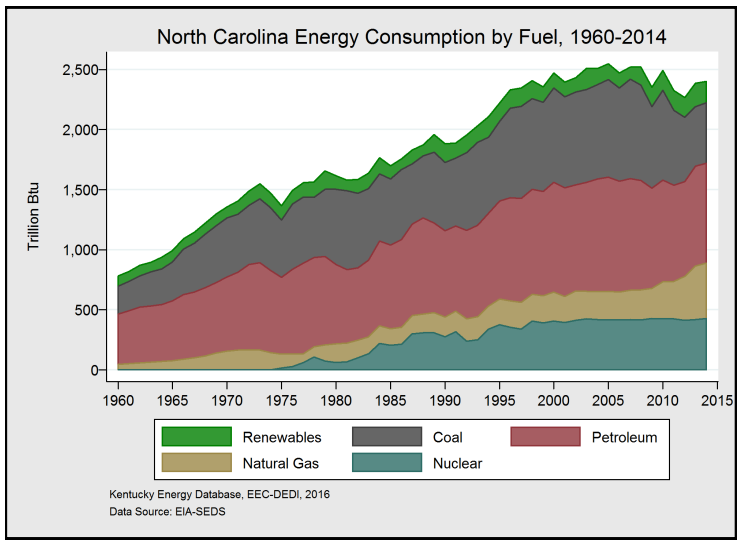
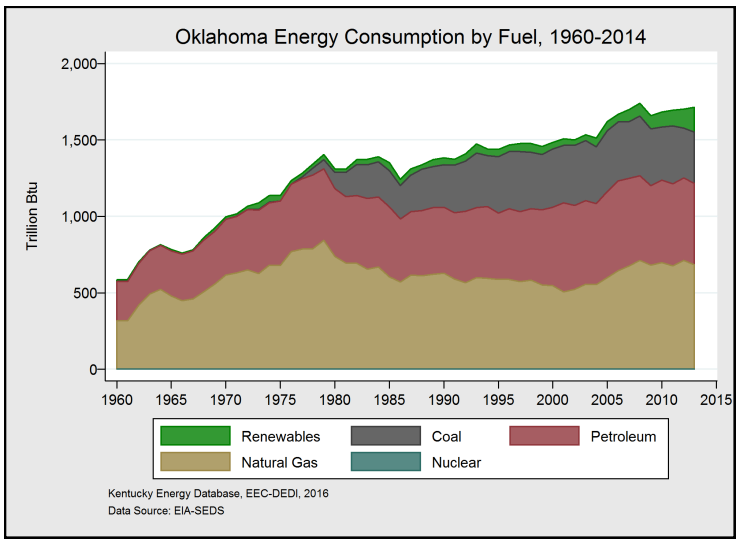
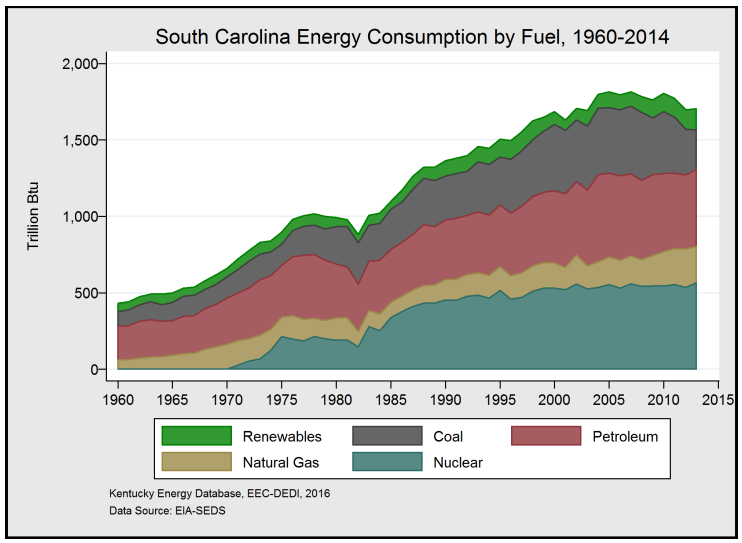


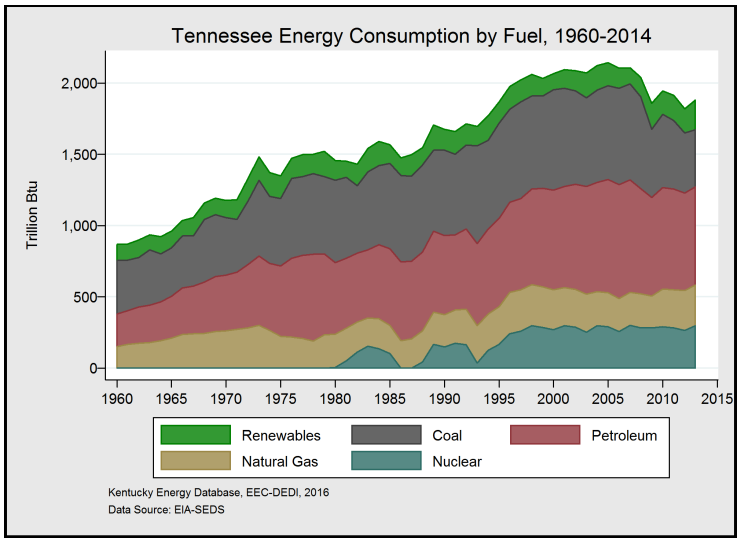



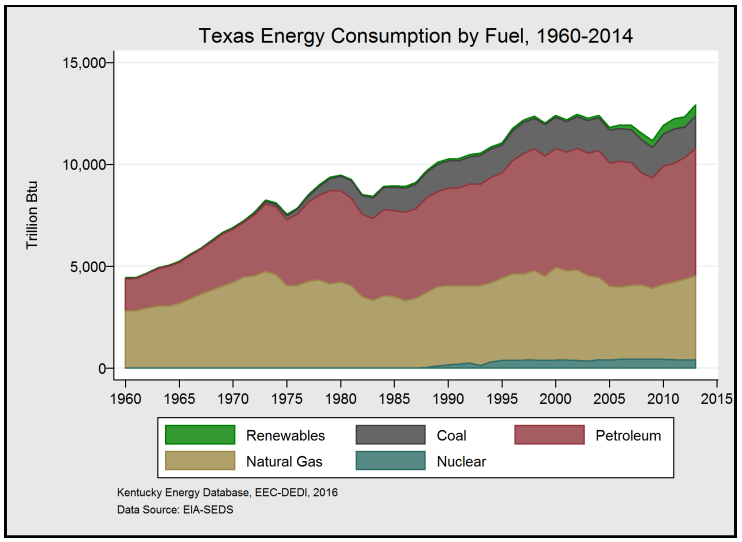



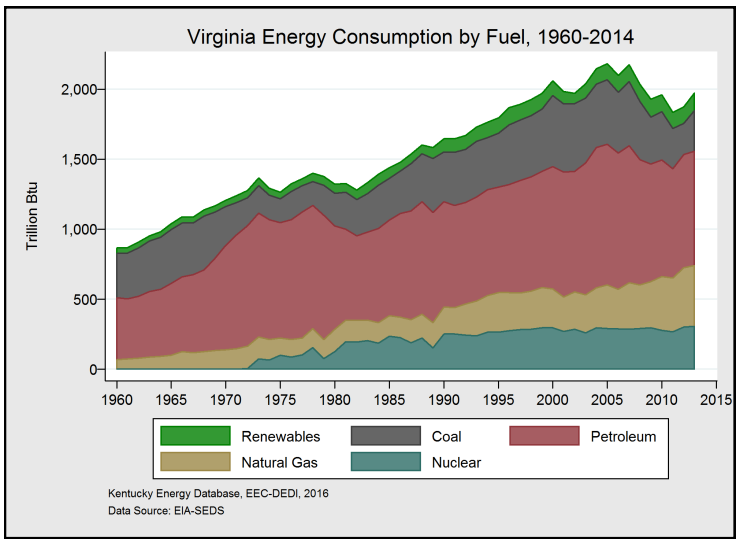



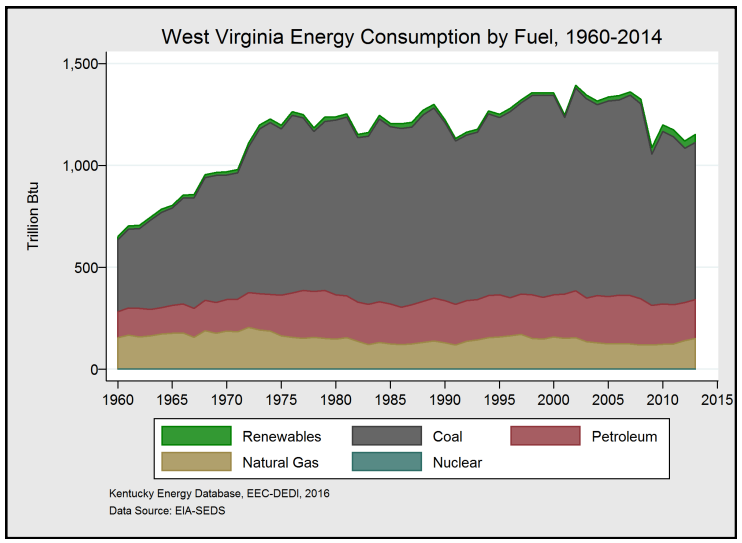



# Historical Energy Consumption by Source

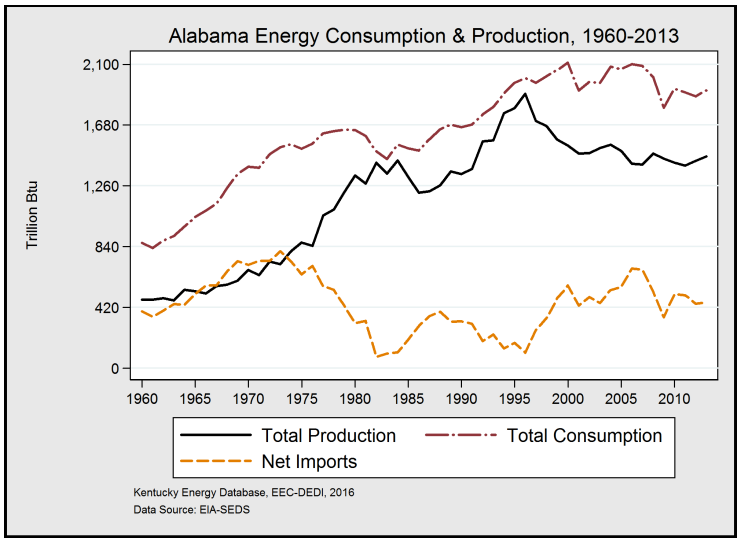


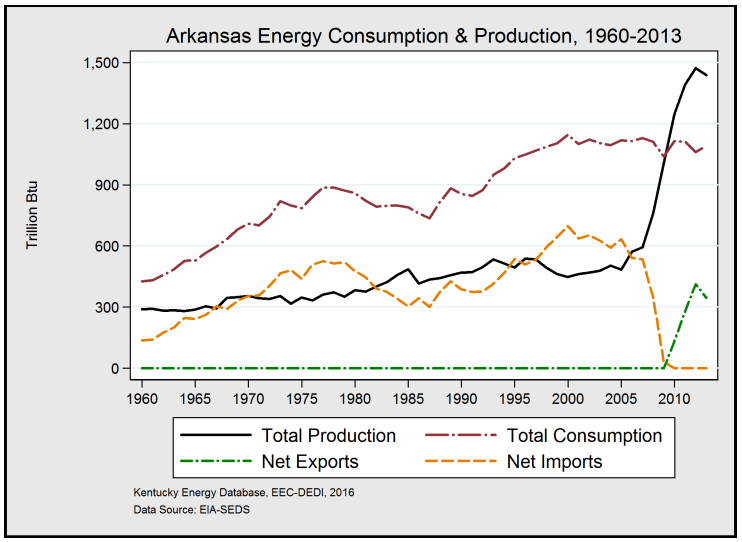



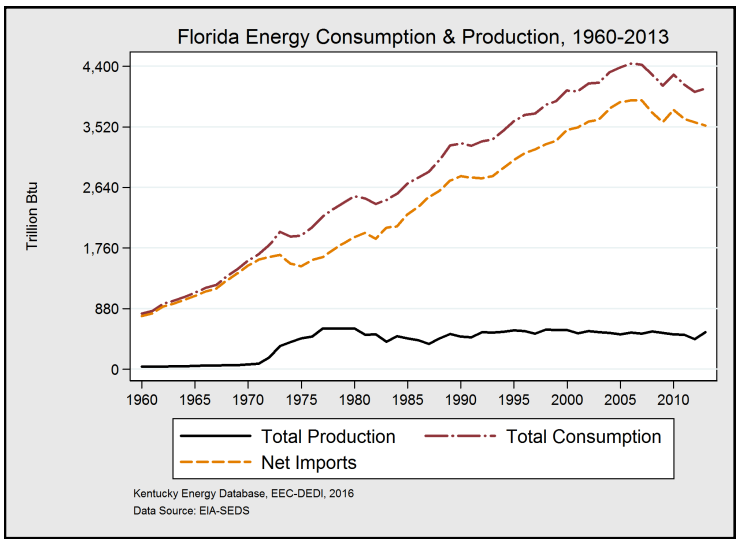



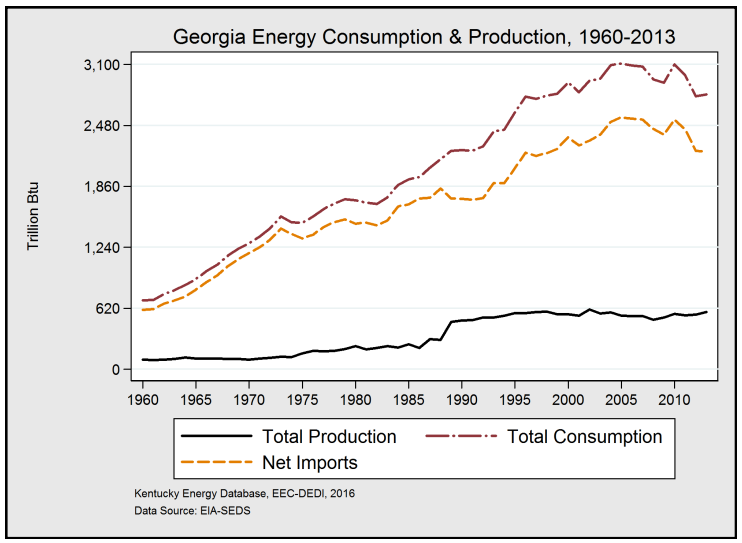



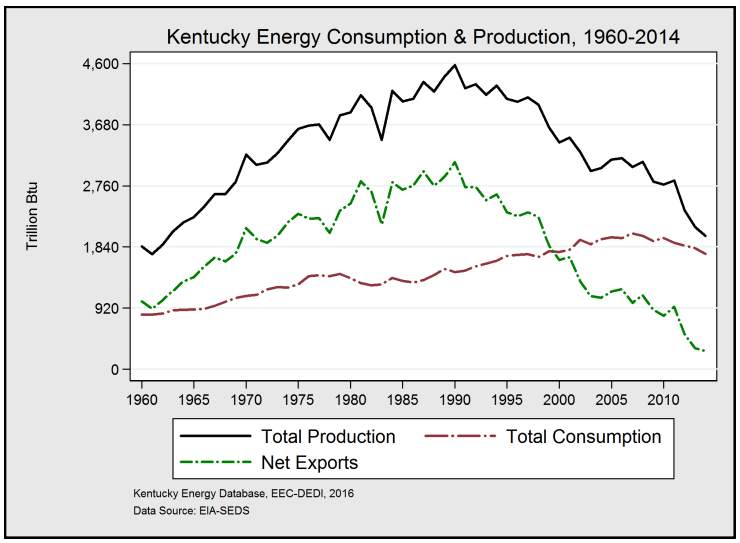
# Historical Net Energy Exports

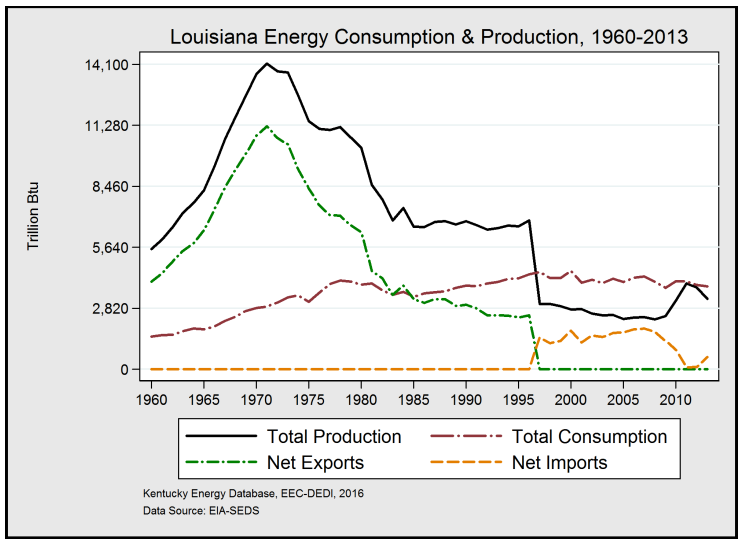


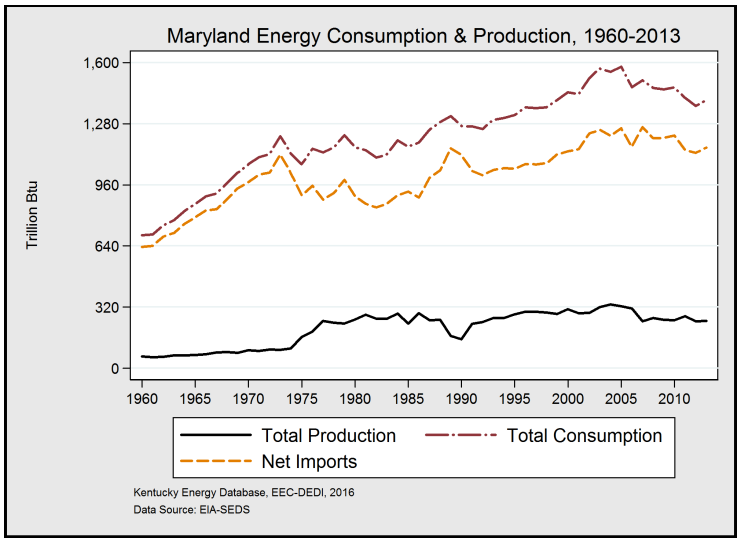



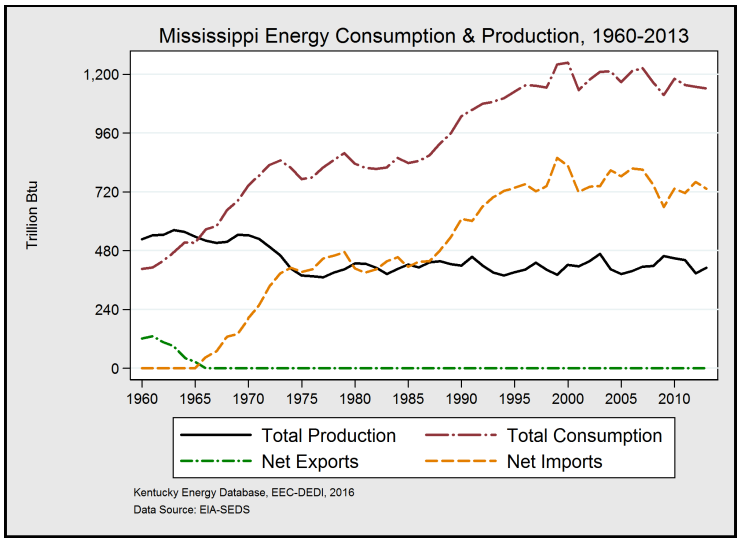



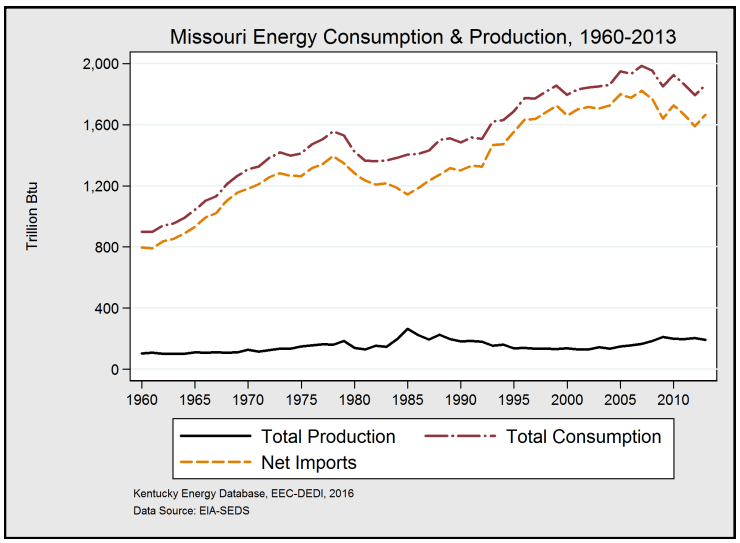



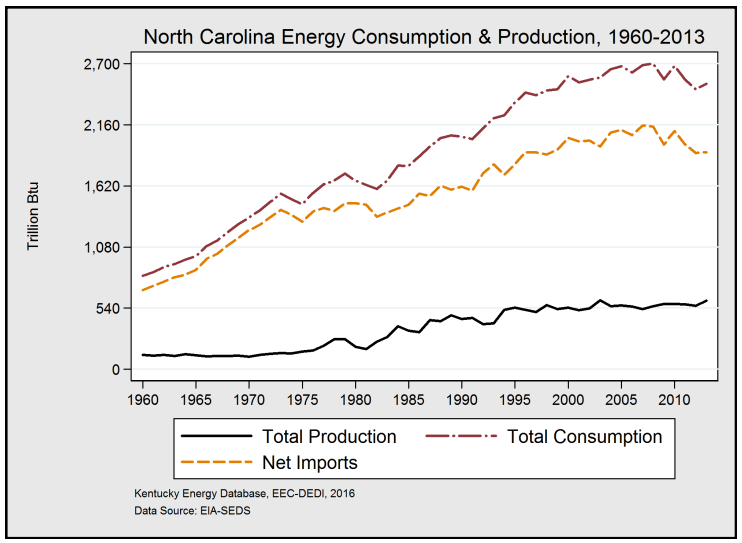

*Louisiana and Texas show substantial fluctuation in energy consumption and production due to the reclassification of offshore energy extraction during this time series.*

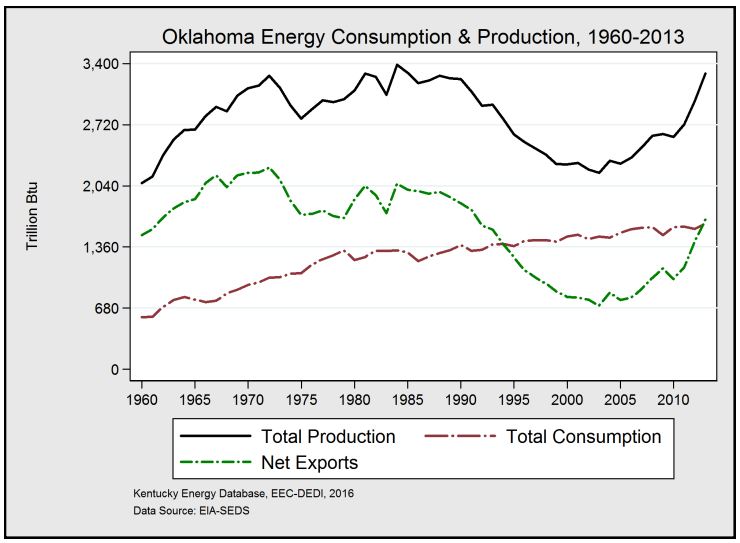
# Historical Net Energy Exports

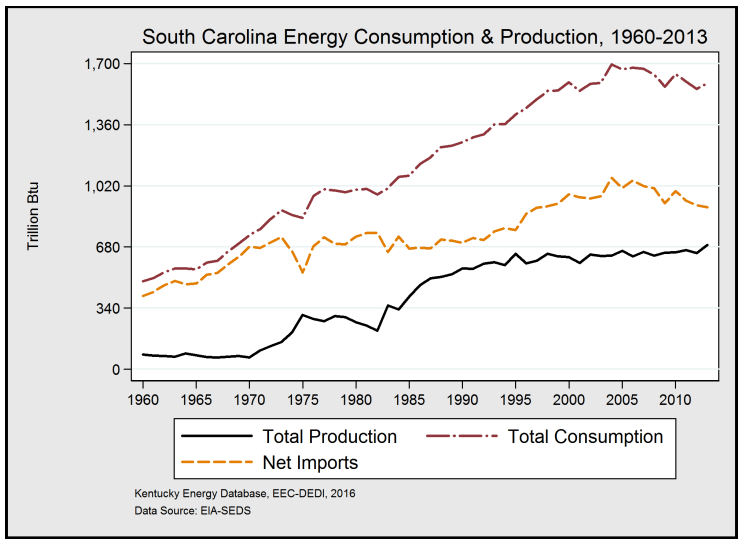


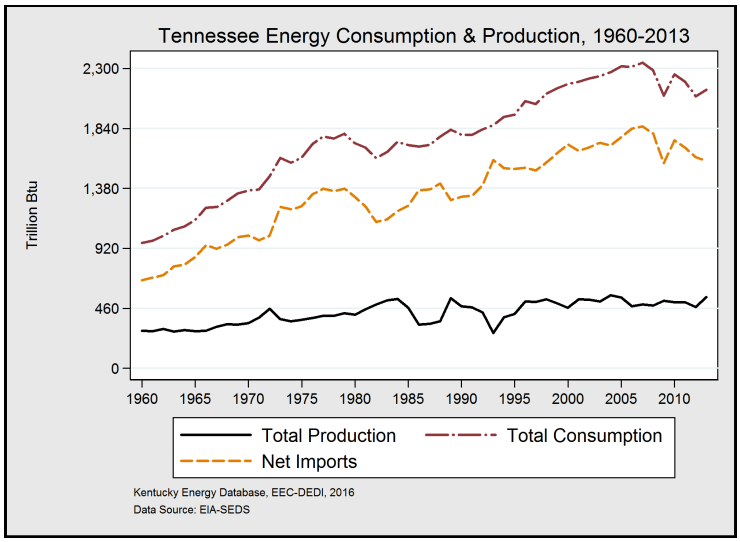



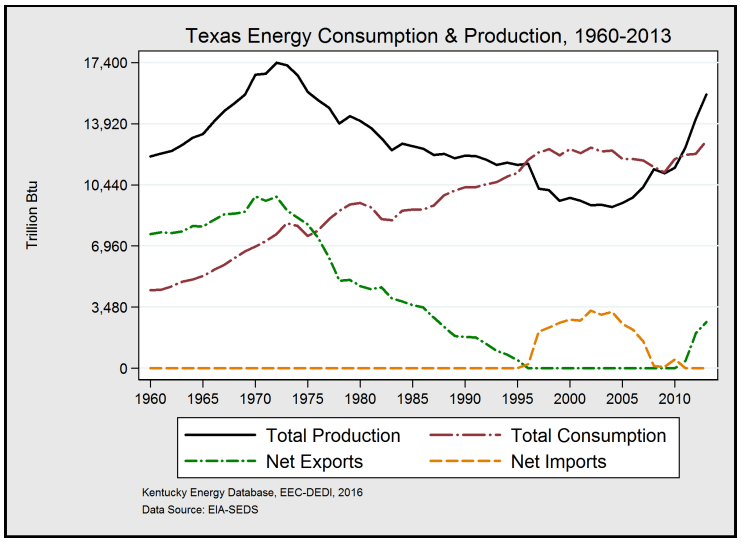



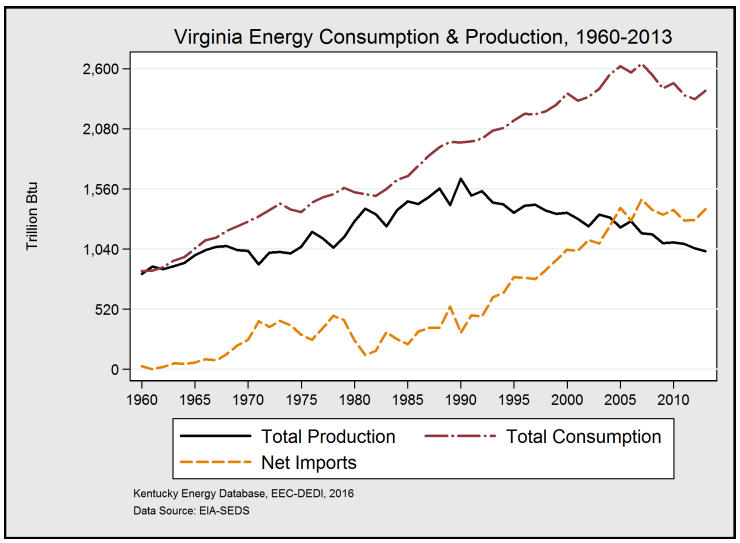



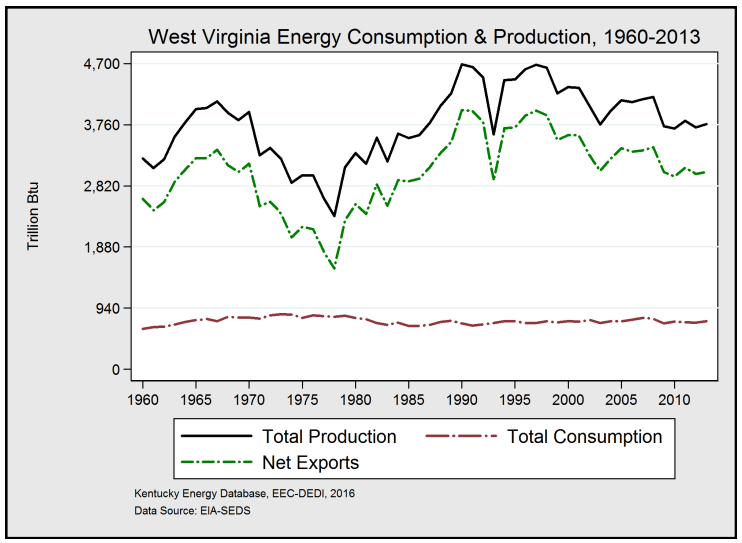



# Historical Net Energy Exports




*Louisiana and Texas show substantial fluctuation in energy consumption and production due to the reclassification of offshore energy extraction during this time series.*

# Glossary

**Aviation Gasoline**: A complex mixture of relatively volatile hydrocarbons with or without small quantities of additives, blended to form a fuel suitable for use in aviation reciprocating engines.

**Biomass**: Organic non-fossil material of biological origin constituting a renewable energy source.

**British Thermal Unit (Btu)**: The quantity of heat required to raise the temperature of 1 pound of liquid water by 1 degree Fahrenheit at the temperature at which water has its greatest density (approximately 39 degrees Fahrenheit).

**Central Appalachian Basin**: The Central Appalachian Coal Basin is the middle basin of three basins that comprise the Appalachian Coal Region of the eastern United States. It includes parts of Kentucky, Tennessee, Virginia, and West Virginia.

**Coal**: A naturally occurring, combustible, sedimentary rock containing at least 50 percent by weight organic matter, a solid "fossil" fuel.

**Commercial Sector**: An energy-consuming sector that consists of service-providing facilities and equipment of businesses; federal, state, and local governments; educational institutions, and other private and public organizations, such as religious, social, or fraternal groups.

**Diesel**: A fuel composed of distillates obtained in petroleum refining operation, or blends of such distillates with residual oil used in motor vehicles.

**Electric Power Sector**: An energy-consuming sector that consists of electricity only and combined heat and power (CHP) plants whose primary business is to sell electricity, or electricity and heat, to the public (NAICS 22). This sector includes electric utilities and independent power producers.

**Electric Service Area**: The geographic area served exclusively by one retail electricity provider.

**Electricity Distribution**: The delivery of electrical energy to a customer's home or business through low-voltage lines (typically at 69kV or less).

**Electricity Generation**: The conversion of energy resources into electric power.

**Electricity Rate**: The average amount of money charged for each unit of electrical energy (kWh) distributed to a customer.

**Electricity Transmission**: The movement or transfer of electric energy at high voltage over an interconnected group of lines and associated equipment between points of supply and points at which it is transformed for delivery to consumers or is delivered to other electric systems.

**Energy Consumption**: The processes of converting energy supplies into useful forms such as heat, steam, electricity, and motion.

**Energy Production**: The processes of extraction, collection, or utilization of energy resources for the purpose of creating accessible energy supplies (i.e. available for sale and distribution).

**Ethanol**: A clear, colorless, flammable alcohol. Ethanol is typically produced biologically from biomass feedstocks such as agricultural crops and cellulosic residues from agricultural crops or wood.

**Gasoline**: A complex mixture of relatively volatile hydrocarbons with or without small quantities of additives, blended to form a fuel suitable for use in spark-ignition engines.

**Geothermal Energy**: Hot water or steam extracted from Geothermal reservoirs in the earth's crust. Also, a subterranean energy source utilized by residential heat pumps and air conditioning units.

# Glossary

**Gigawatt (GW)**: A measure of electrical power. Specifically, one billion watts or one thousand megawatts.

**Gigawatt Hour (GWh)**: A measure of electrical energy defined as a unit of work, measured as 1 Gigawatt (1,000,000,000 watts) of power expended for 1 hour.

**Hydroelectric Energy**: The use of flowing water to produce electrical energy.

**Illinois Basin**: The coal producing areas of Western Kentucky, Southern Illinois, and Southwest Indiana.

**Industrial Sector**: An energy-consuming sector that consists of all facilities and equipment used for producing, processing, or assembling goods. The industrial sector encompasses the following types of activity: manufacturing, agriculture, forestry, fishing and hunting; mining, oil and gas extraction, and construction.

**Jet Fuel**: A refined petroleum product used in jet aircraft engines. It includes kerosene-type Jet Fuel and naphtha-type Jet Fuel.

**Kerosene**: A light petroleum distillate that is used in space heaters, cook stoves, and water heaters and is suitable for use as a light source when burned in wick-fed lamps.

**Kilowatt (kW)**: A measure of electrical power. Specifically, one thousand watts.

**Kilowatt Hour (kWh)**: A measure of electrical energy defined as a unit of work, measured as 1 Kilowatt (1,000 watts) of power expended for 1 hour.

**Megawatt (MW)**: A measure of electrical power. Specifically, one million watts.

**Megawatt Hour (MWh)**: A measure of electrical energy defined as a unit of work, measured as 1 Megawatt (1,000,000 watts) of power expended for 1 hour.

**Natural Gas**: A naturally occurring combustible mixture of light hydrocarbon (primarily methane) and inorganic gases that often occurs in porous and permeable sedimentary rocks, a gaseous "fossil" fuel.

**Natural Gas Liquids**: Propane and butanes, which are dissolved in natural gas at reservoir pressure but condense into liquids at normal atmospheric pressure. Also called condensates, these liquids are removed from initial natural gas production and refined into a variety of additional energy products.

**Net Energy Consumption**: The measurement of the total British Thermal Unit (Btu) value of energy resources utilized or combusted, subtracting the quantity of energy lost in the conversion of a primary energy source into a secondary, useful energy source.

**Nuclear Power:** Electricity generated by the use of the thermal energy released from the fission of nuclear fuel in a reactor.

**Nuclear Fuel:** Fissionable materials that have been enriched to such a composition that, when placed in a nuclear reactor, will support a self-sustaining fission chain reaction, producing heat in a controlled manner for process use.

**Petroleum**: A mixture of hydrocarbons that exists in liquid phase in natural underground reservoirs and remains liquid at atmospheric pressure after passing through surface separating facilities.

**Renewable Energy**: There is no formal, universally accepted definition for this term. Typical usage may define renewable energy as energy resources that are naturally replenishing but flow-limited. Such resources are virtually inexhaustible in duration but limited in the amount of energy that is available per unit of time.

# Glossary

**Residential Sector**: An energy-consuming sector that consists of living quarters for private households. Common uses of energy associated with this sector include space heating, water heating, air conditioning, lighting, refrigeration, cooking, and running a variety of other appliances.

**Transportation Sector**: An energy-consuming sector that consists of all vehicles whose primary purpose is transporting people and/or goods from one physical location to another. This sector includes the natural gas utilized in the movement of natural gas resources through transmission pipeline.

**Terawatt:** A measure of electrical energy defined as a unit of work, One Terawatt is 1,000,000,000,000 Watts or $10^{12}$ Watts.

**Volt (V)**: A measure of electrical potential or electromotive force.

**Watt (W)**: The unit of electrical power equal to one ampere under a pressure of one volt. A Watt is equal to 1/746 horse power.

**Wood & Wood Waste**: Wood and wood products, possibly including scrubs, branches, sawdust, etc., bought or gathered, and used by direct combustion.

*This material is based upon work supported by the U.S. Department of Energy National Energy (Headquarters) under grant number DE-FE0004212.*

ALABAMA
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MARYLAND
MISSISSIPPI
MISSOURI
NORTH CAROLINA
OKLAHOMA
PUERTO RICO
SOUTH CAROLINA
TENNESSEE
TEXAS
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*Transcending Boundaries*

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